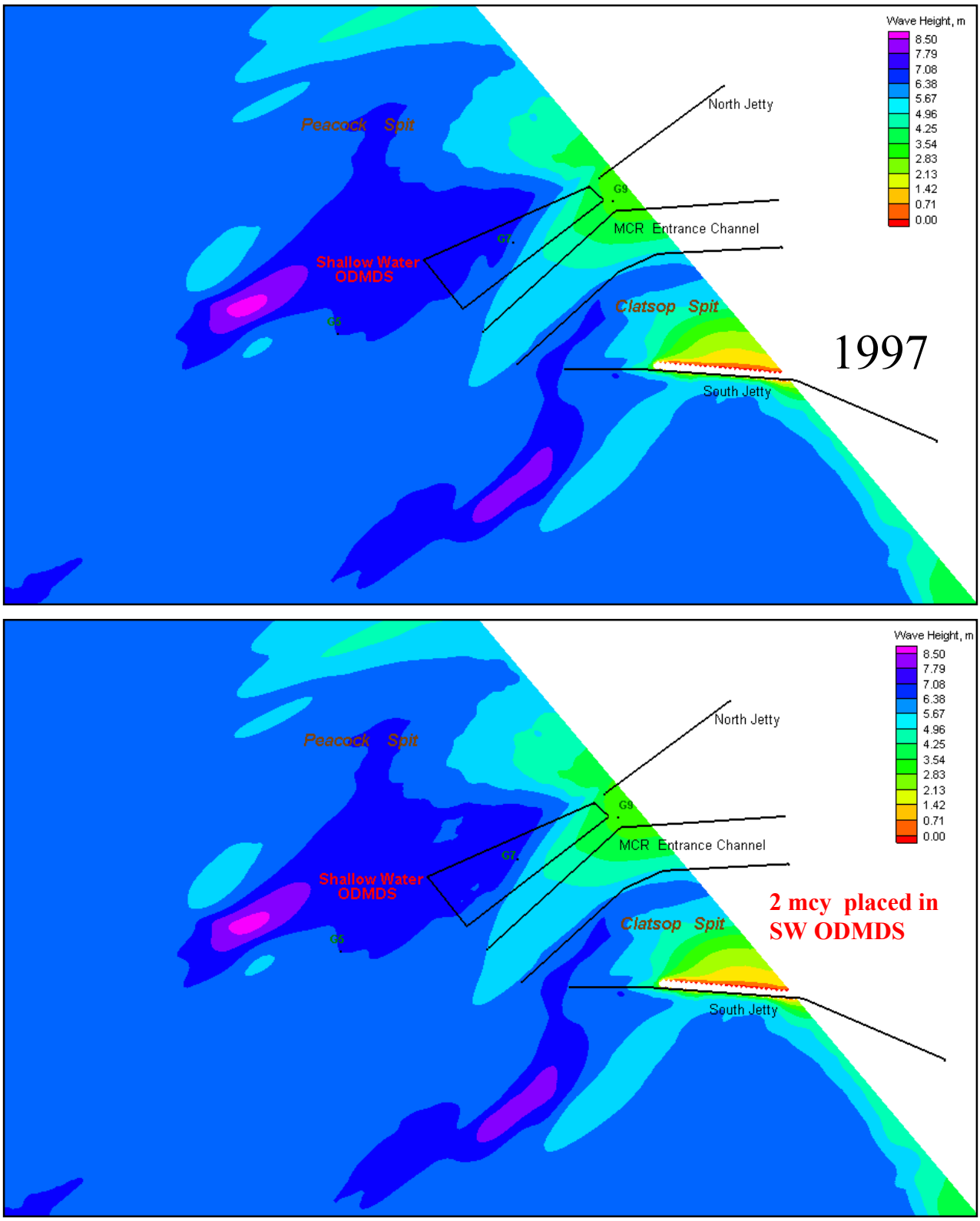
South-Southwest Wave Scenarios for Assessing **2 million cy placement** within Shallow Water ODMDS – Compared to 1997 Baseline Condition

Change in Wave Height

Changes in Wave Amplification

Changes in Wave Breaking



Offshore wave conditions (figure S1) for <u>Winter Storm</u>: Ht= 6.48 m, Tp=12.5 sec, Dir =225 deg, Wind=13.8 m/s @ 180 deg

Figure M1 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2 MCY placed within SWS.

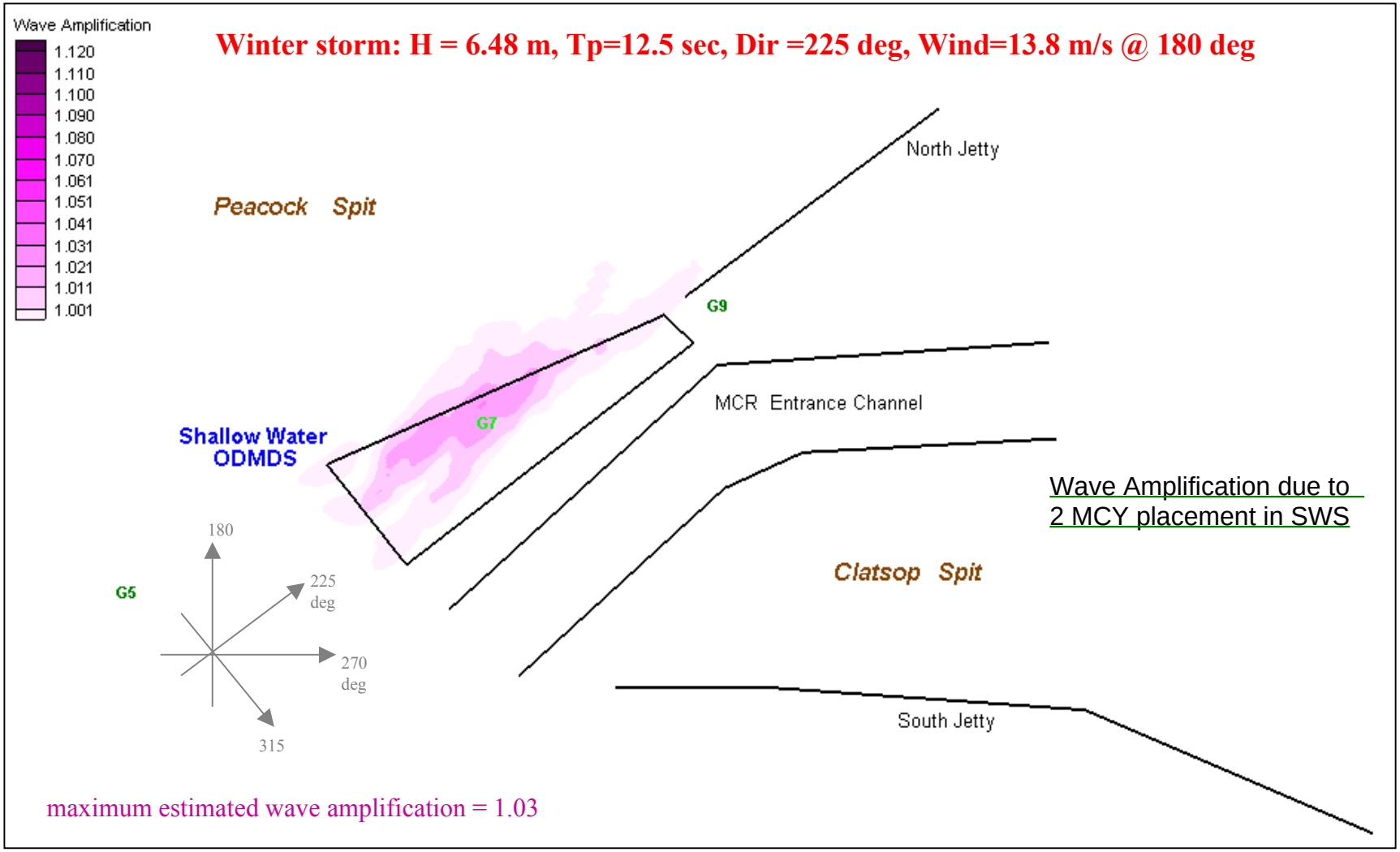
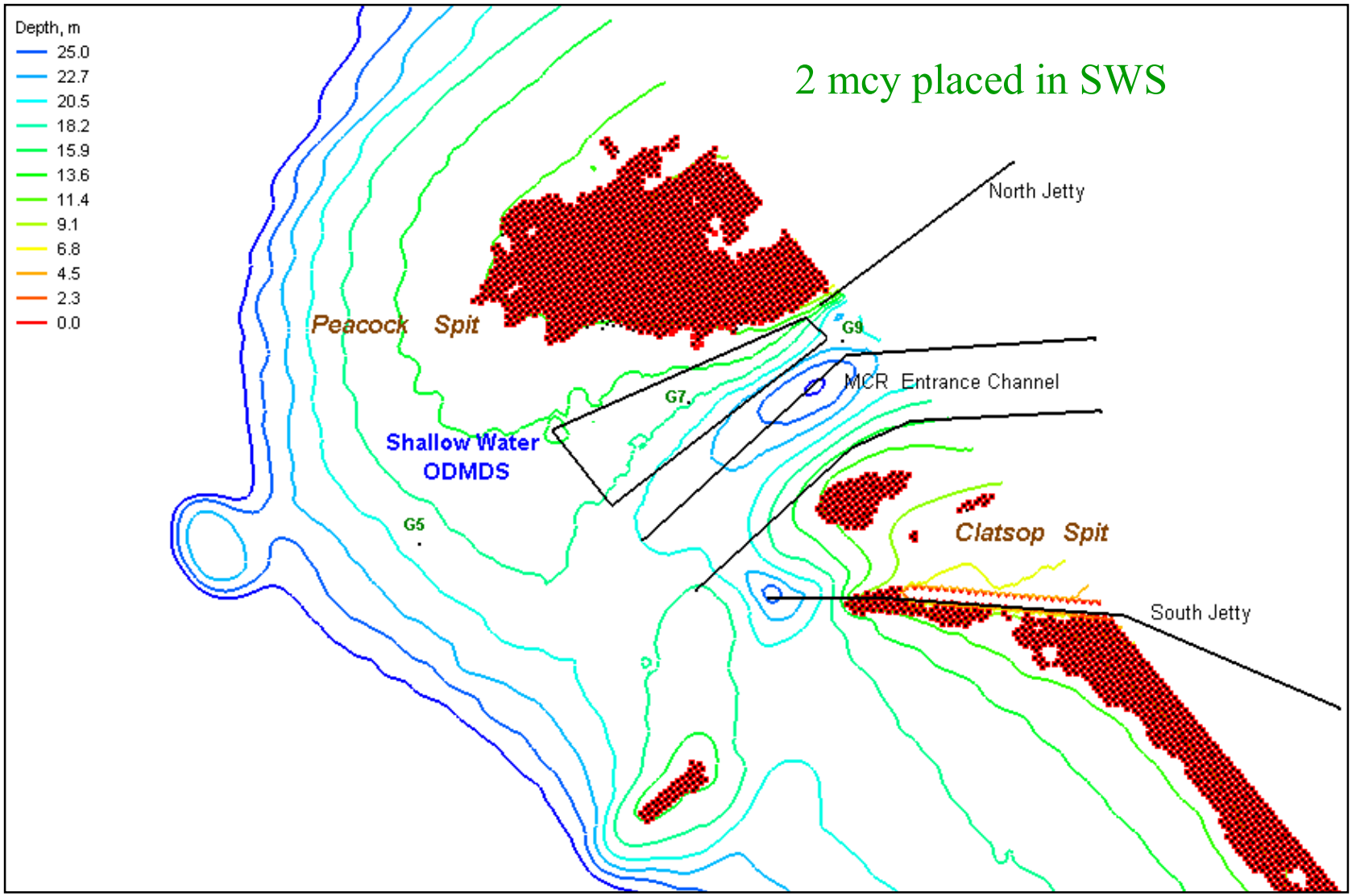
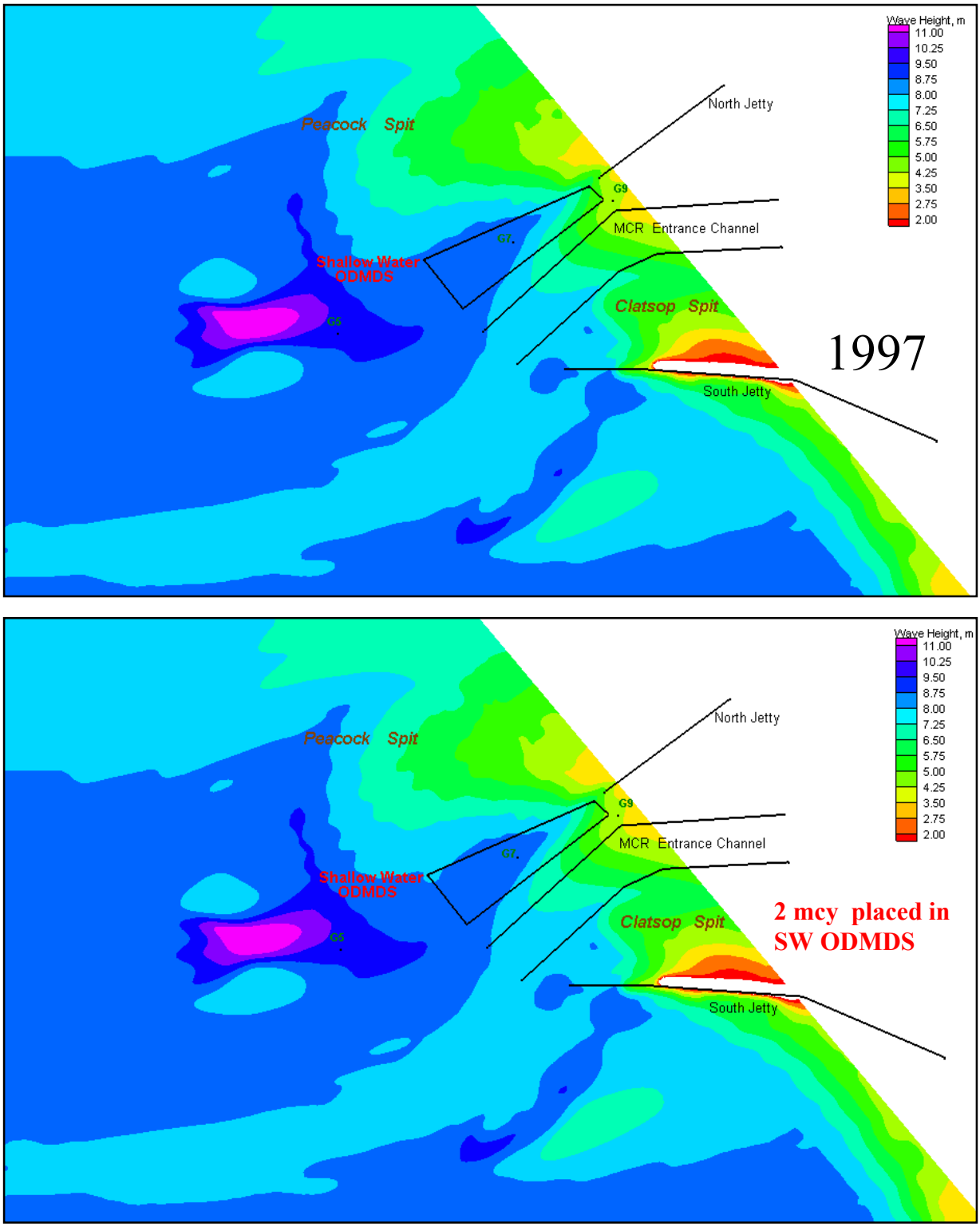


Figure M2 . Estimated wave amplification at MCR due to bathymetry change resulting from 2 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "2mcy wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Storm: Avg. wave height = 6.48 m, Peak wave period =12.5 sec, Avg. wave direction = SW (225 deg), Wind=13.8 m/s @ S (180 deg)

Figure M3. Estimated wave breaking location for 1997 (shown in black markers) and for 2 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+2 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.



Offshore wave conditions (figure S2) for <u>Winter Storm</u>: Ht = 8.34 m, Tp=16.7 sec, Dir =260 deg, Wind=14.2 m/s @ 192 deg

Figure M4. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2 MCY placed within SWS.

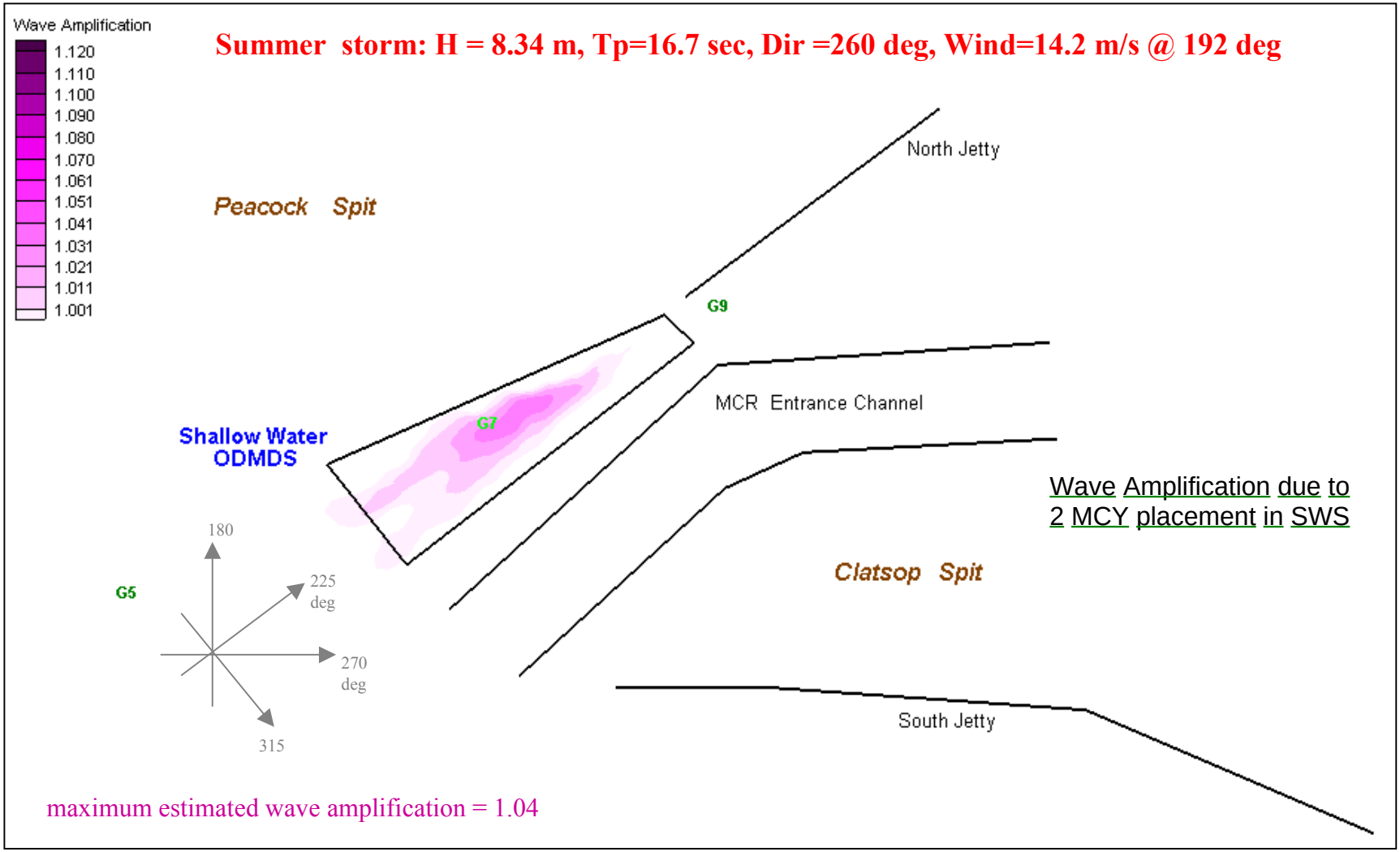


Figure M5 . Estimated wave amplification at MCR due to bathymetry change resulting from 2 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "2 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.

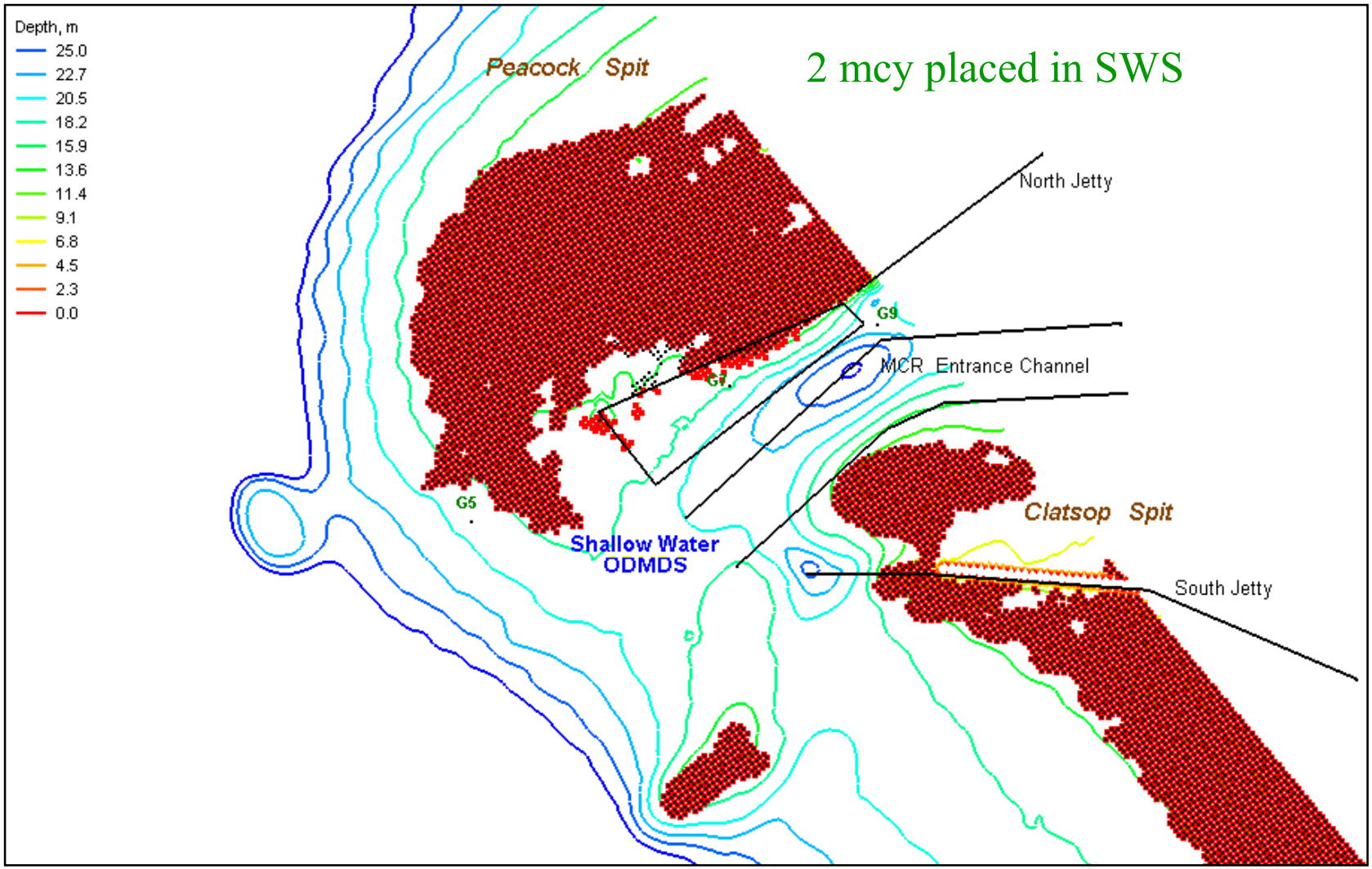
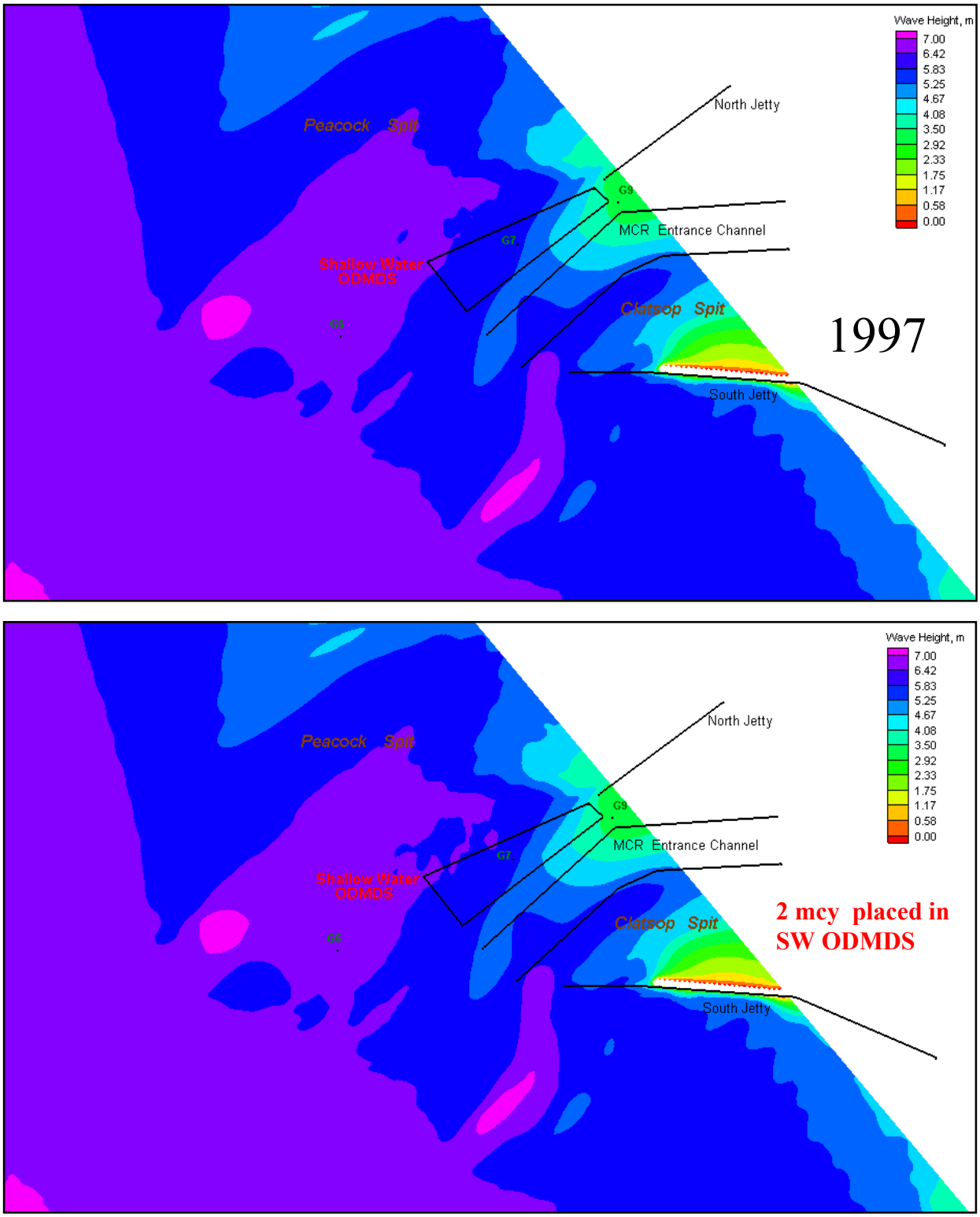


Figure M6. Estimated wave breaking location for 1997 (shown in black markers) and for 2 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+2 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.



Offshore wave conditions (figure S3) for <u>Winter Storm</u>: Ht = 6.78 m, Tp=10.5 sec, Dir =210 deg, Wind=14.8 m/s @ 190 deg

Figure M7. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for2 MCY placed within SWS.

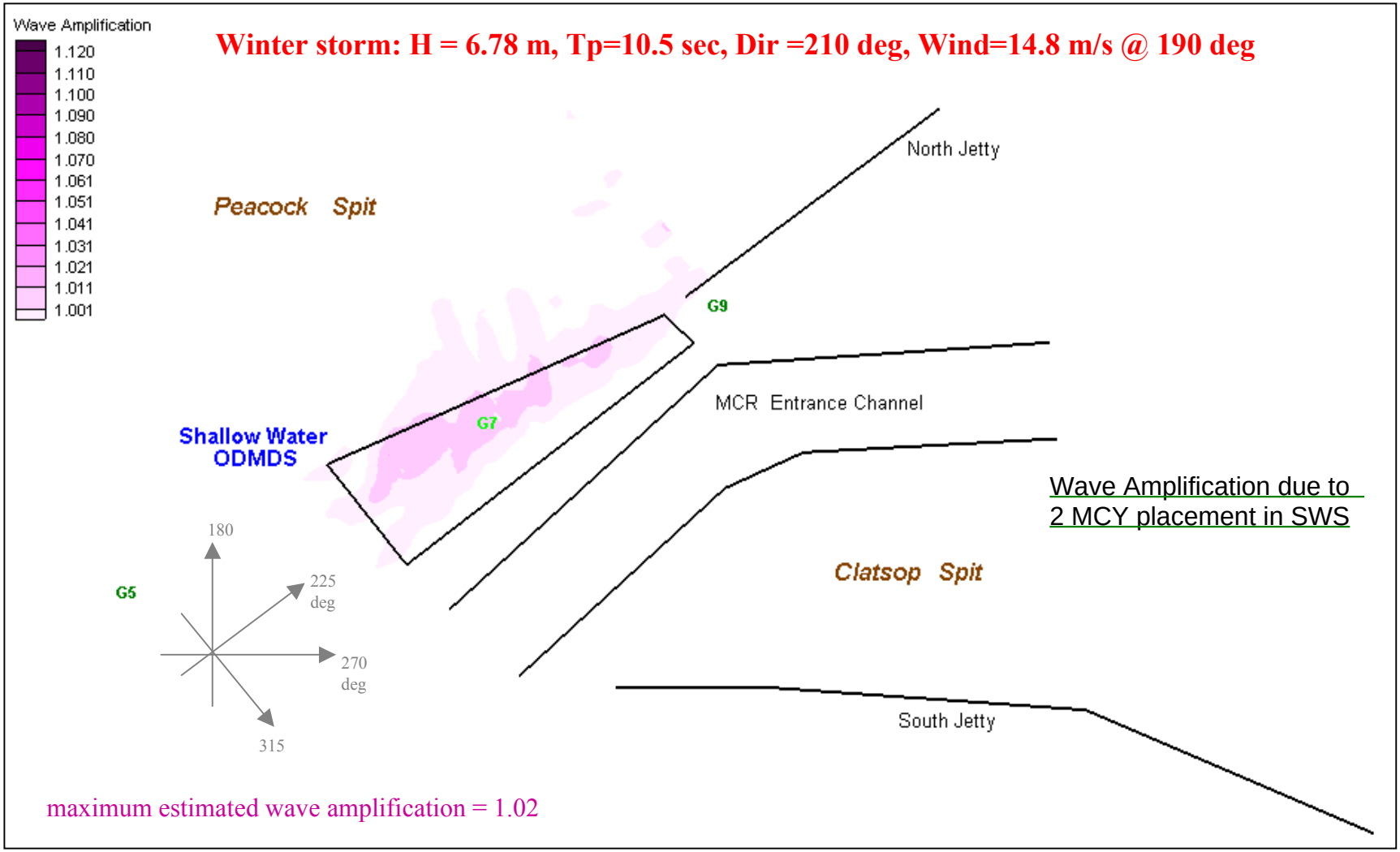


Figure M8 . Estimated wave amplification at MCR due to bathymetry change resulting from 2 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "2 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.

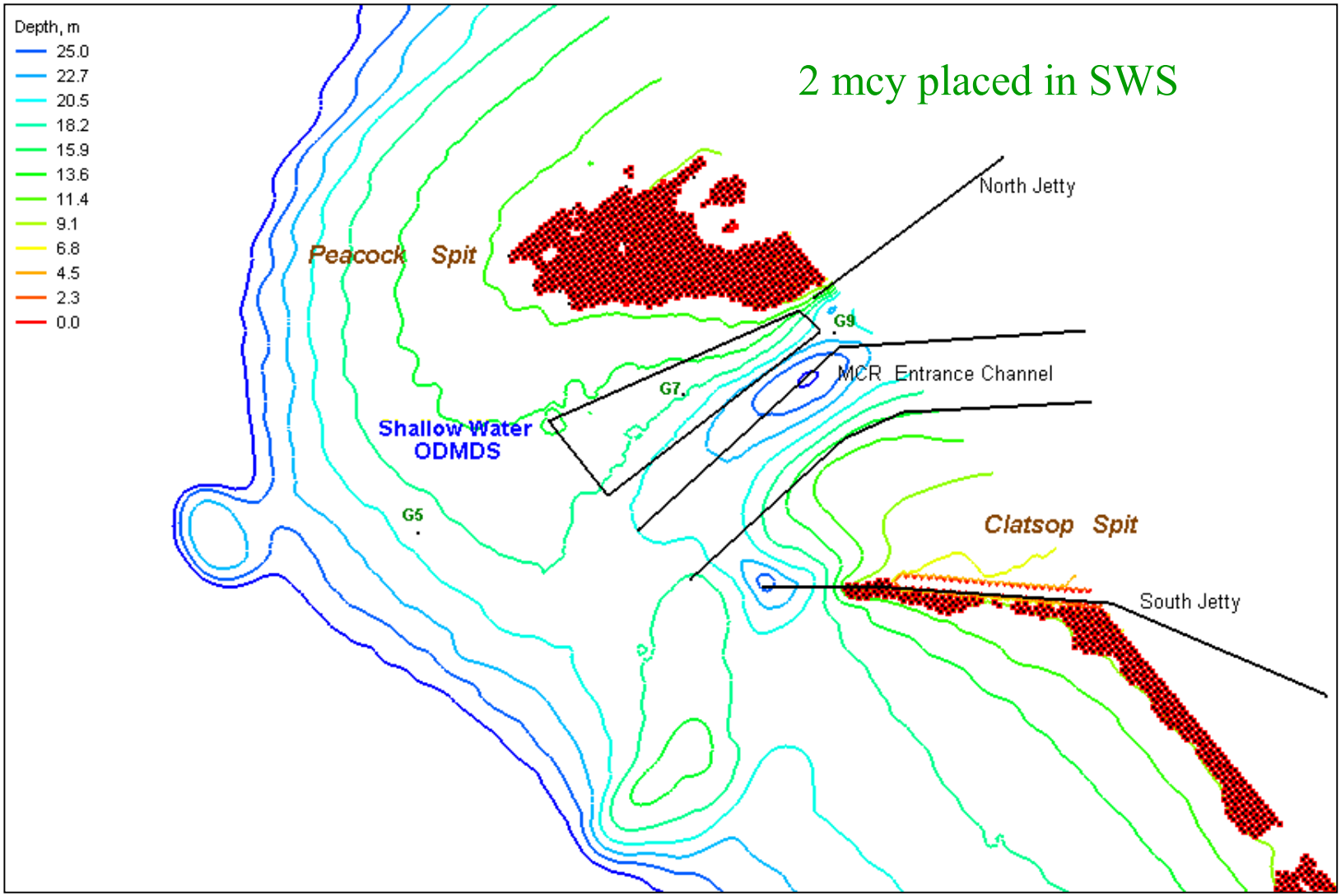
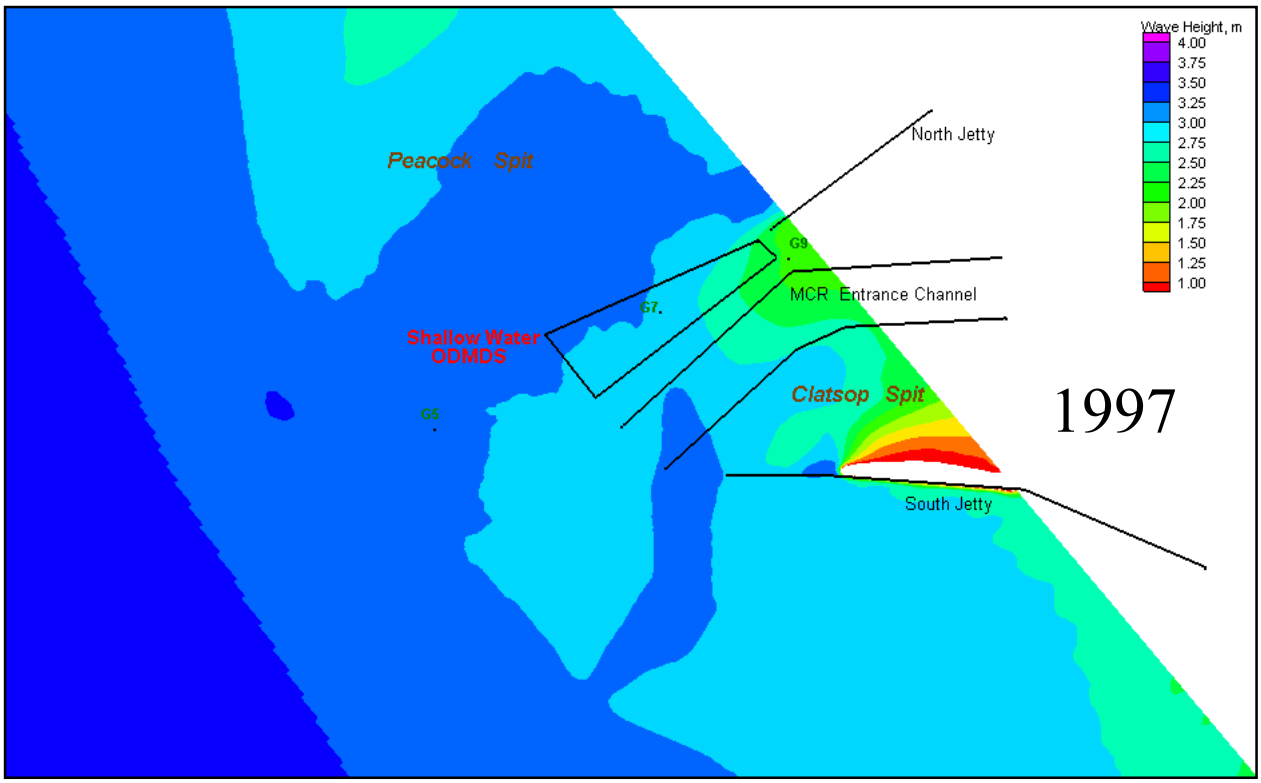
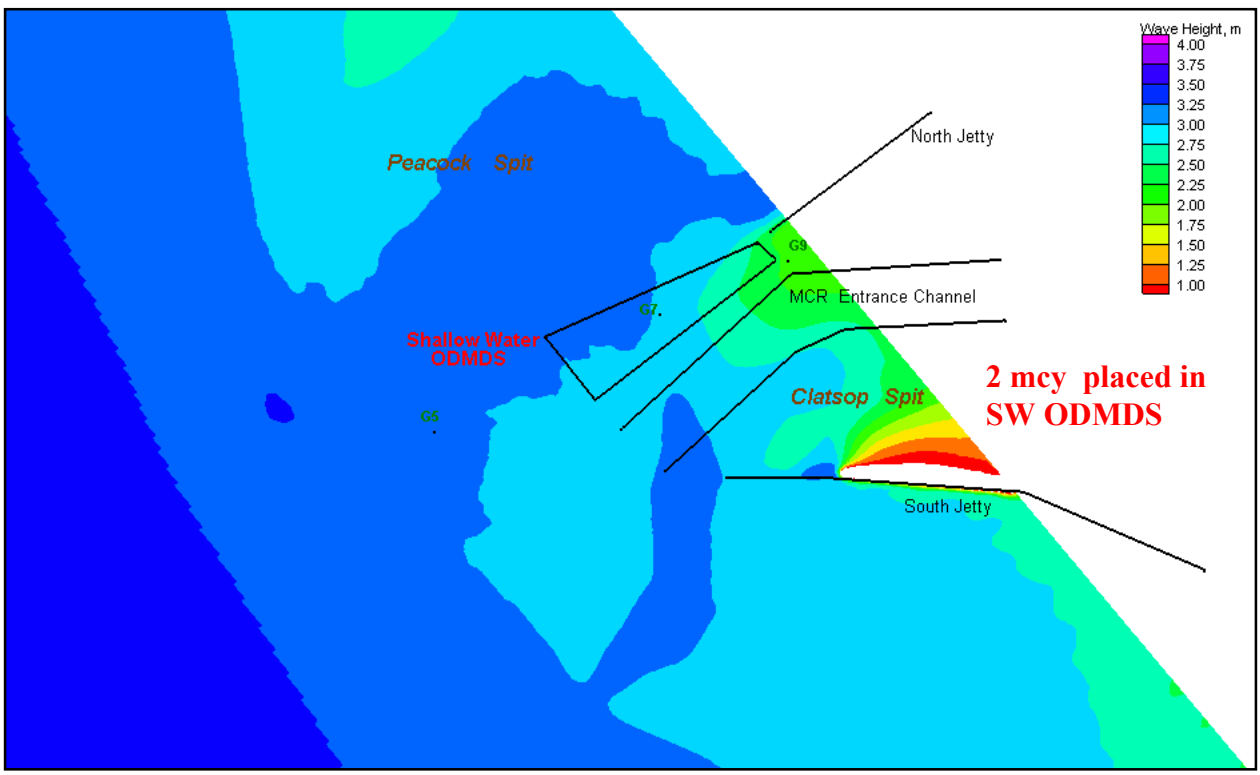


Figure M9. Estimated wave breaking location for 1997 (shown in black markers) and for 2 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+2 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.





Offshore wave conditions (figure S4) for <u>Summer Storm</u>: Ht = 3.56 m, Tp=7.7 sec, Dir =200 deg, Wind=10.6 m/s @ 178 deg

Figure M10 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2 MCY placed within SWS.

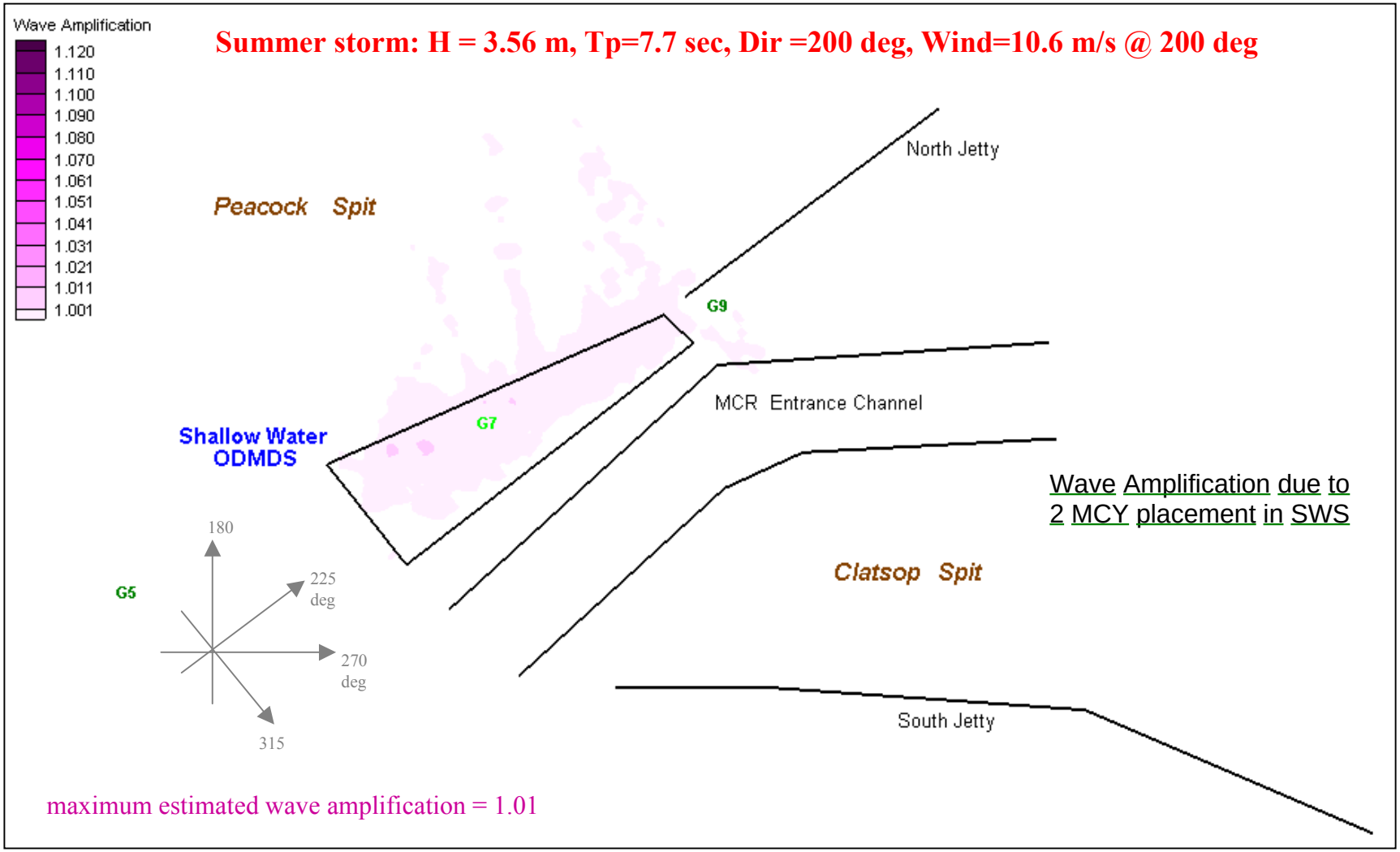
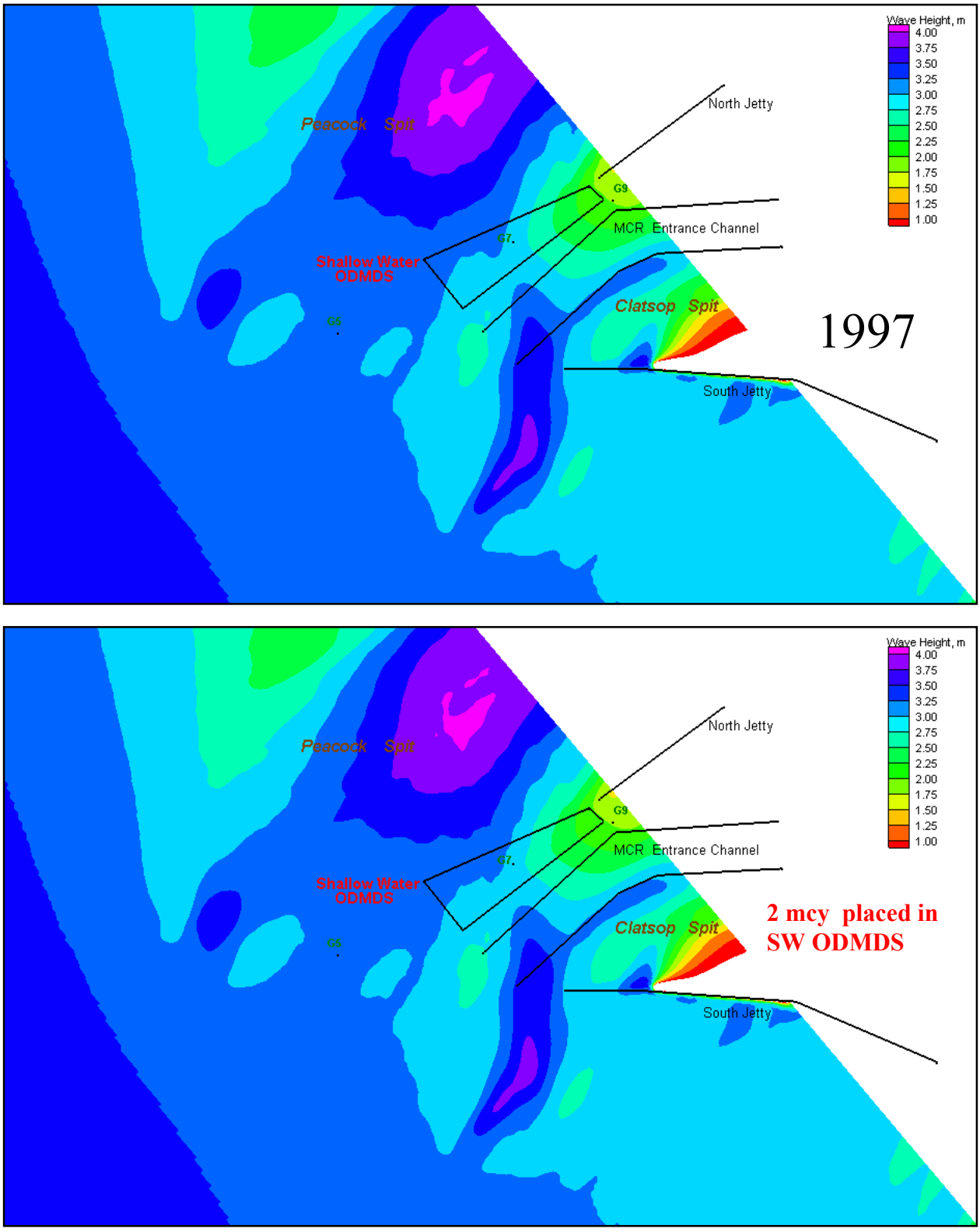


Figure M11 . Estimated wave amplification at MCR due to bathymetry change resulting from 2 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "2 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Offshore wave conditions (figure S5) for Summer Storm: Ht = 3.51 m, Tp=10.5 sec, Dir =175 deg, Wind=8.8 m/s @ 165 deg

Figure M12 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2 MCY placed within SWS.

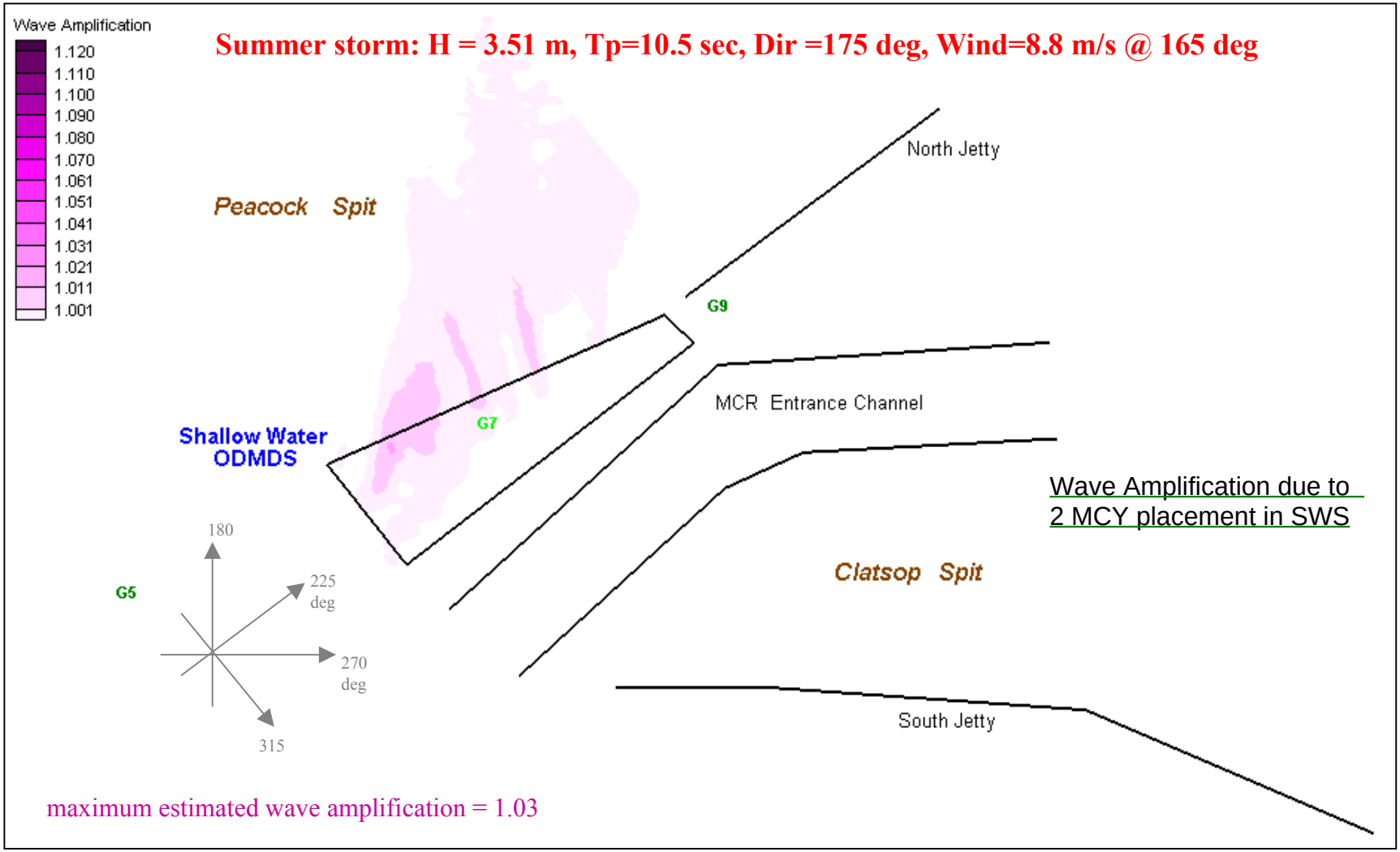


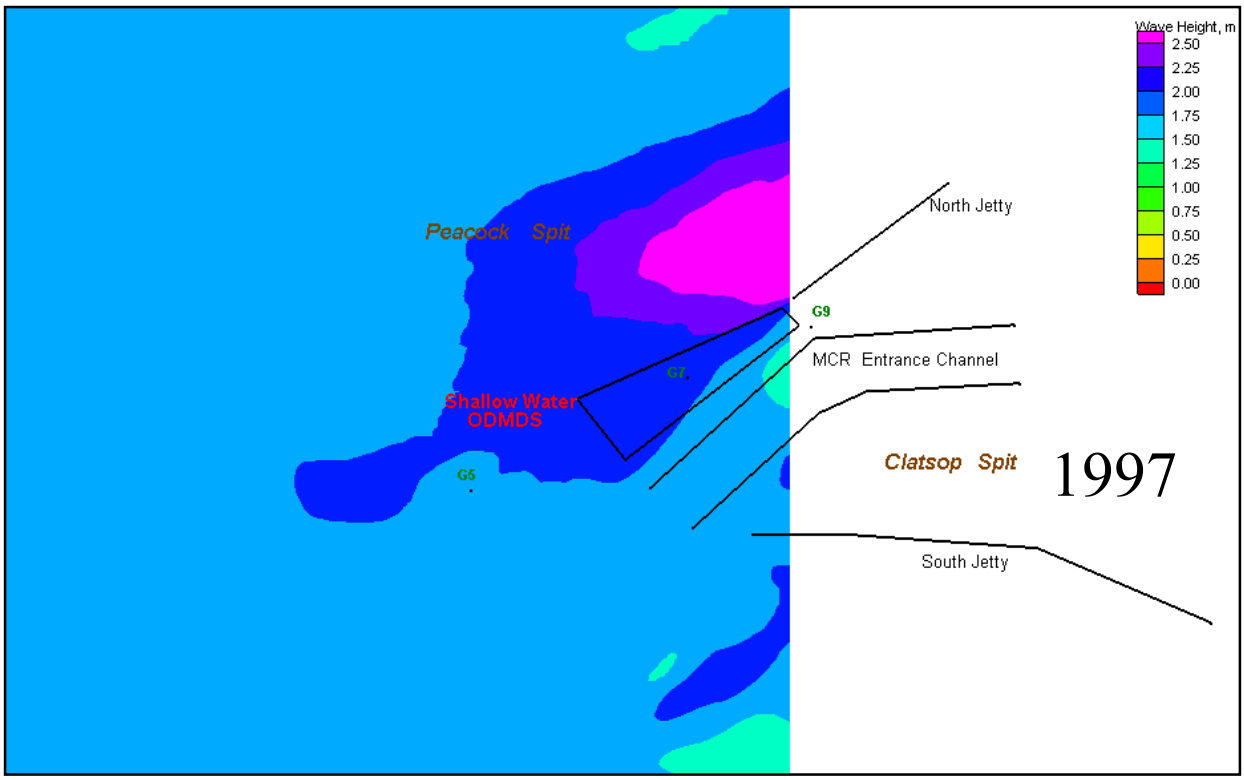
Figure M13 . Estimated wave amplification at MCR due to bathymetry change resulting from 2 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "2 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.

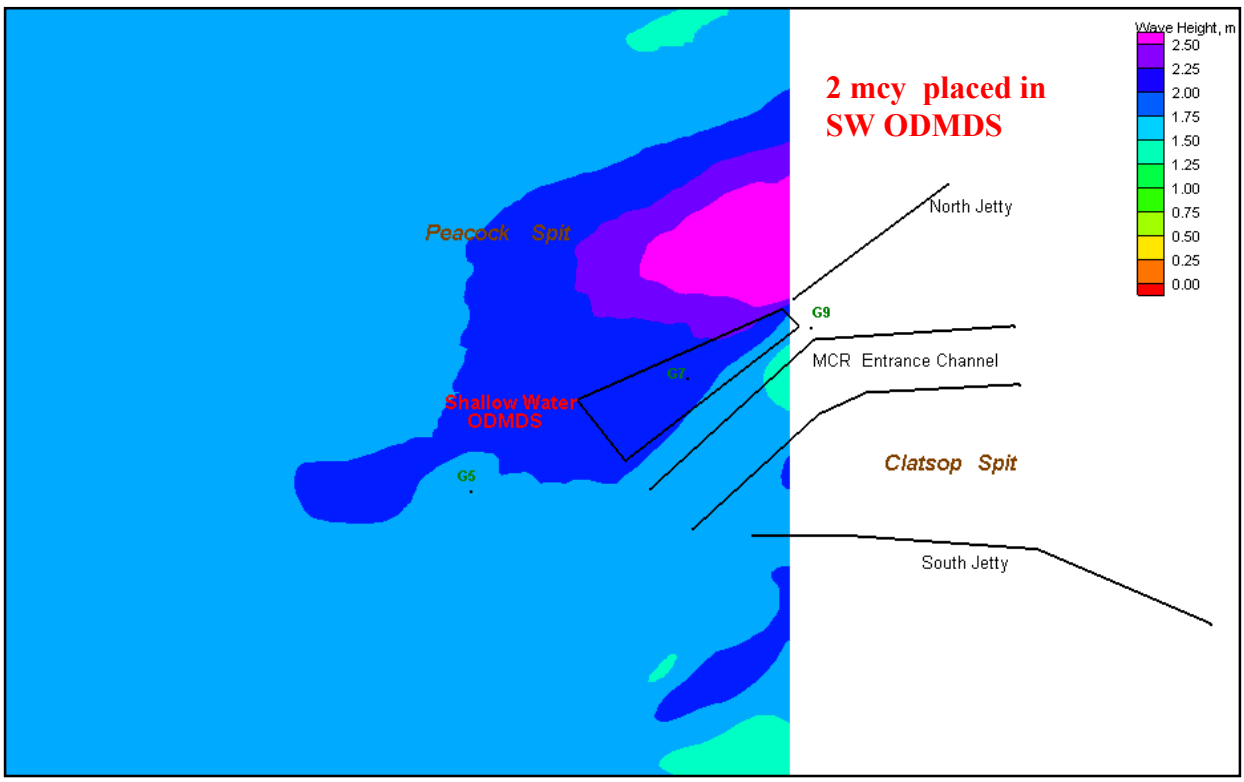
North-Northwest Wave Scenarios for Assessing **2 million cy placement** within Shallow Water ODMDS – Compared to 1997 Baseline Condition

Change in Wave Height

Changes in Wave Amplification

Changes in Wave Breaking





Offshore wave conditions (figure S6) for Summer Swell: Ht = 1.79 m, Tp=11.0 sec, Dir =275 deg, Wind=5.9 m/s @ 329 deg

Figure M14 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2 MCY placed within SWS.

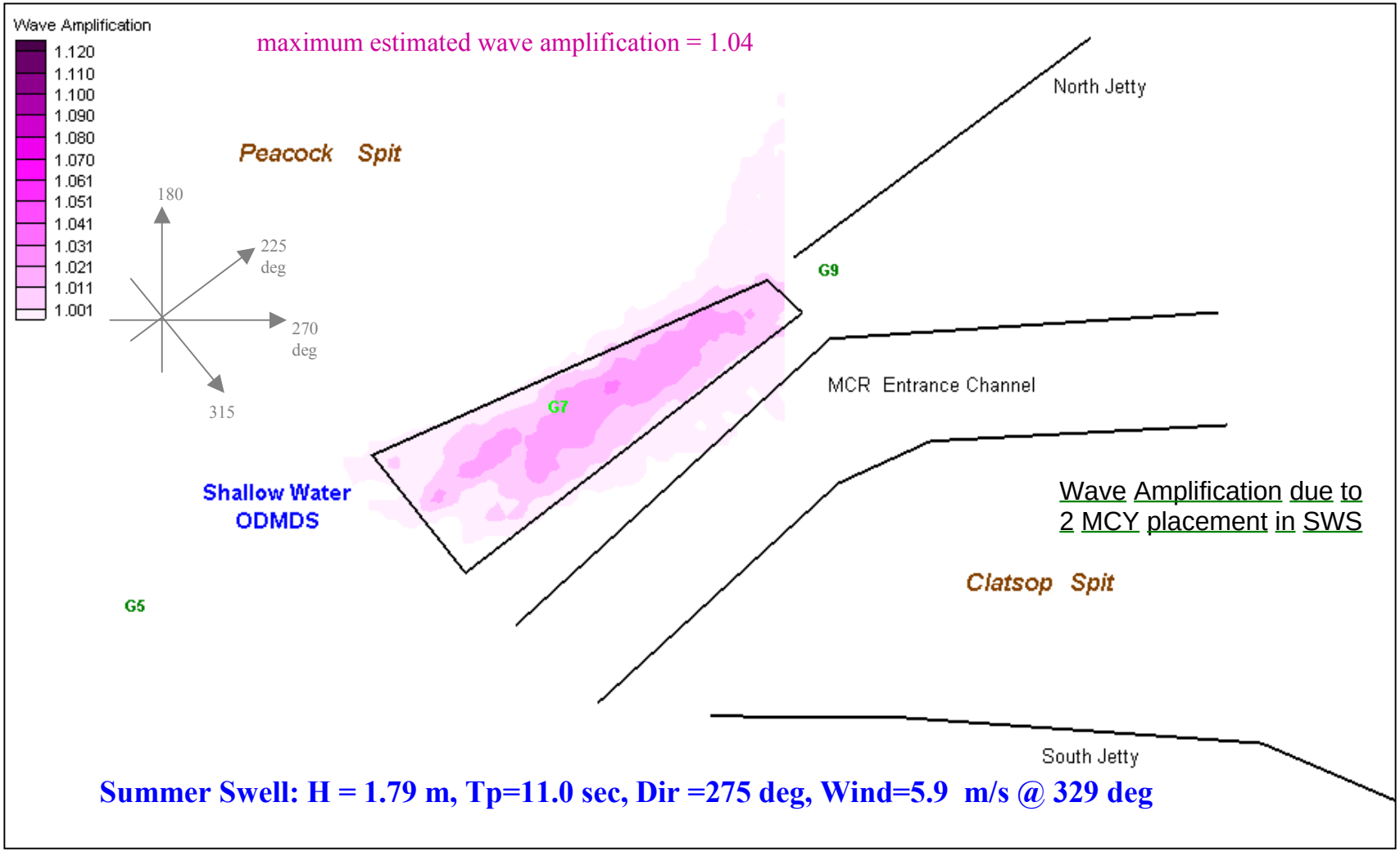
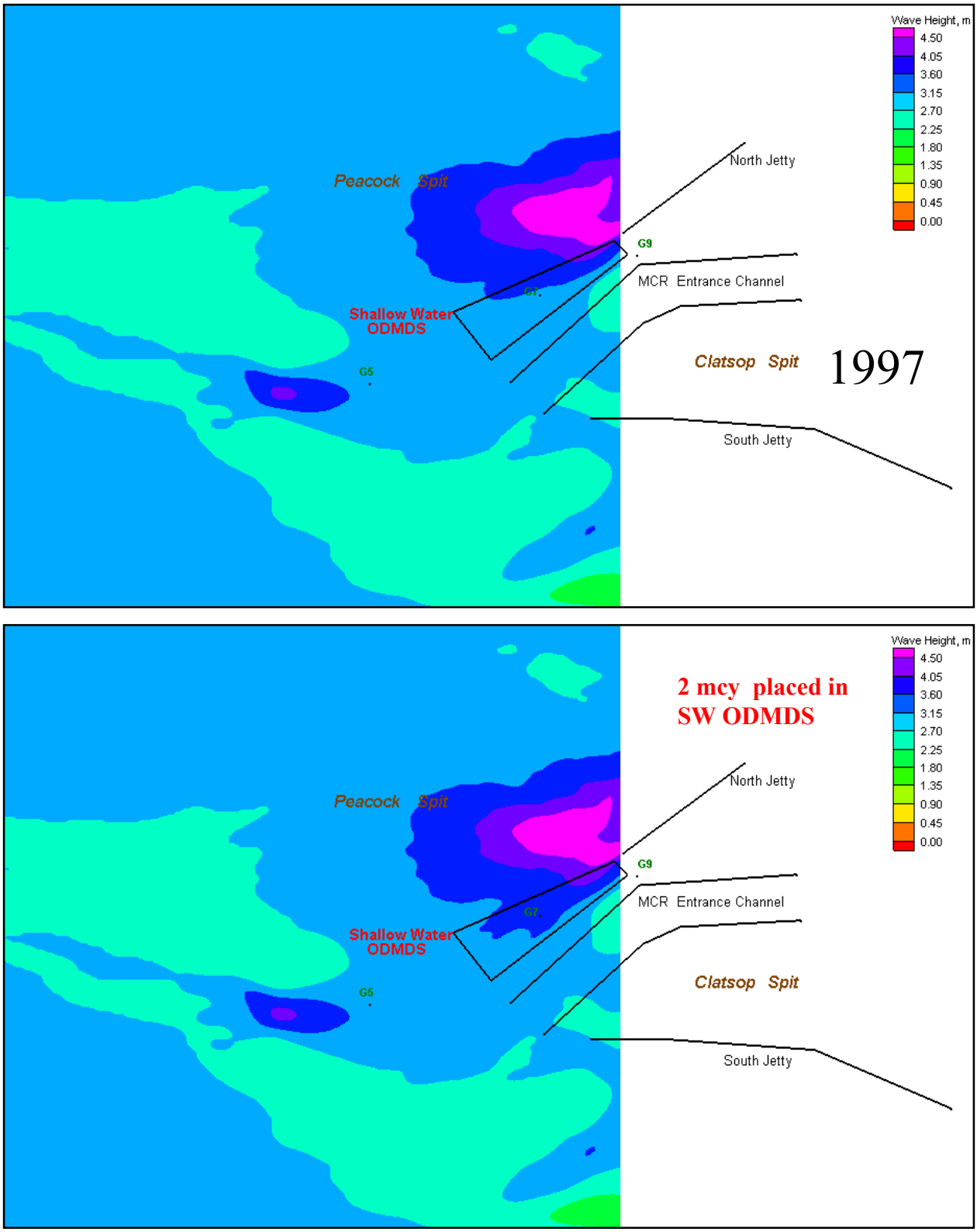


Figure M15 . Estimated wave amplification at MCR due to bathymetry change resulting from 2 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "2 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Offshore wave conditions (figure S7) for Winter Swell: Ht = 2.85 m, Tp=16.7 sec, Dir =280 deg, Wind=4.8 m/s @ 158 deg

Figure M16 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2 MCY placed within SWS.

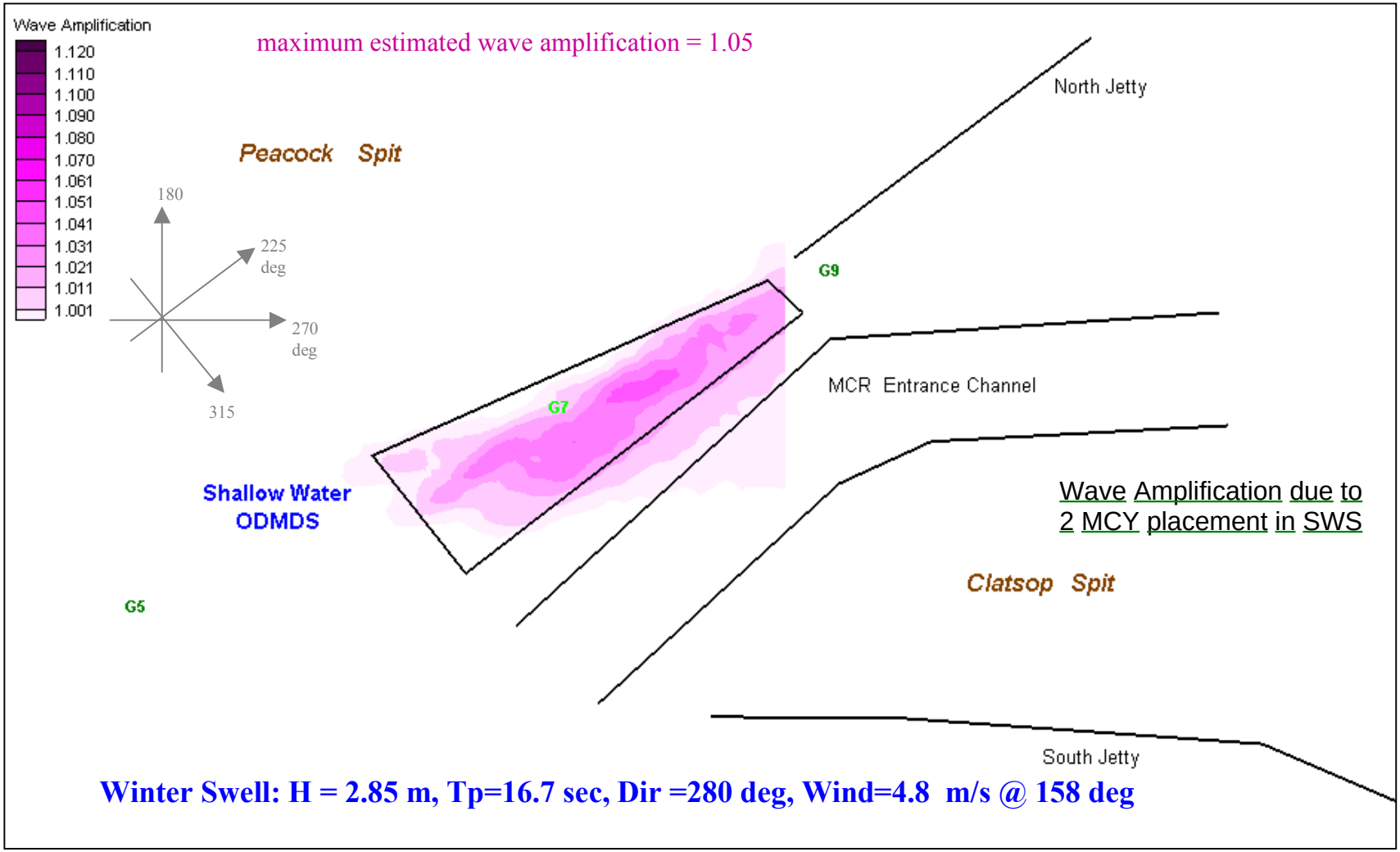
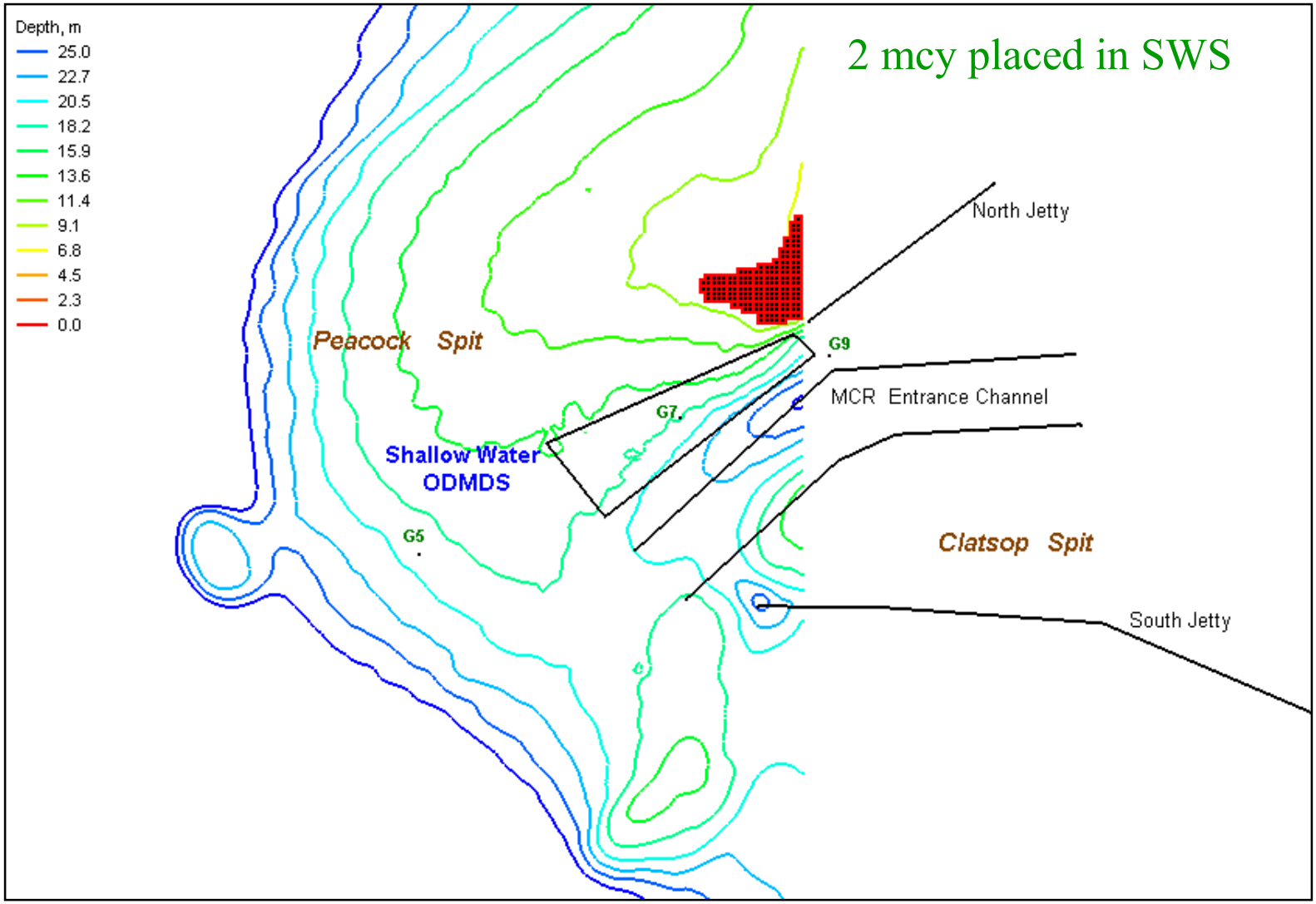
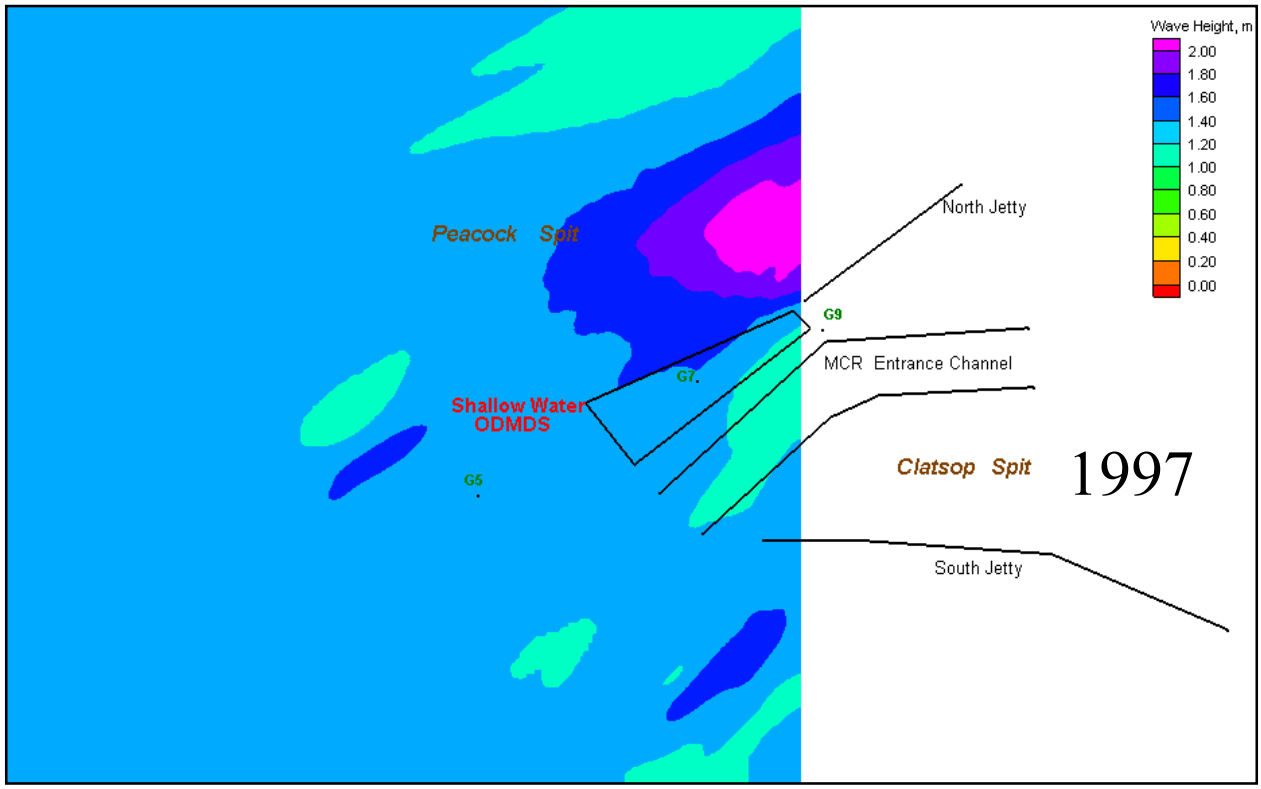


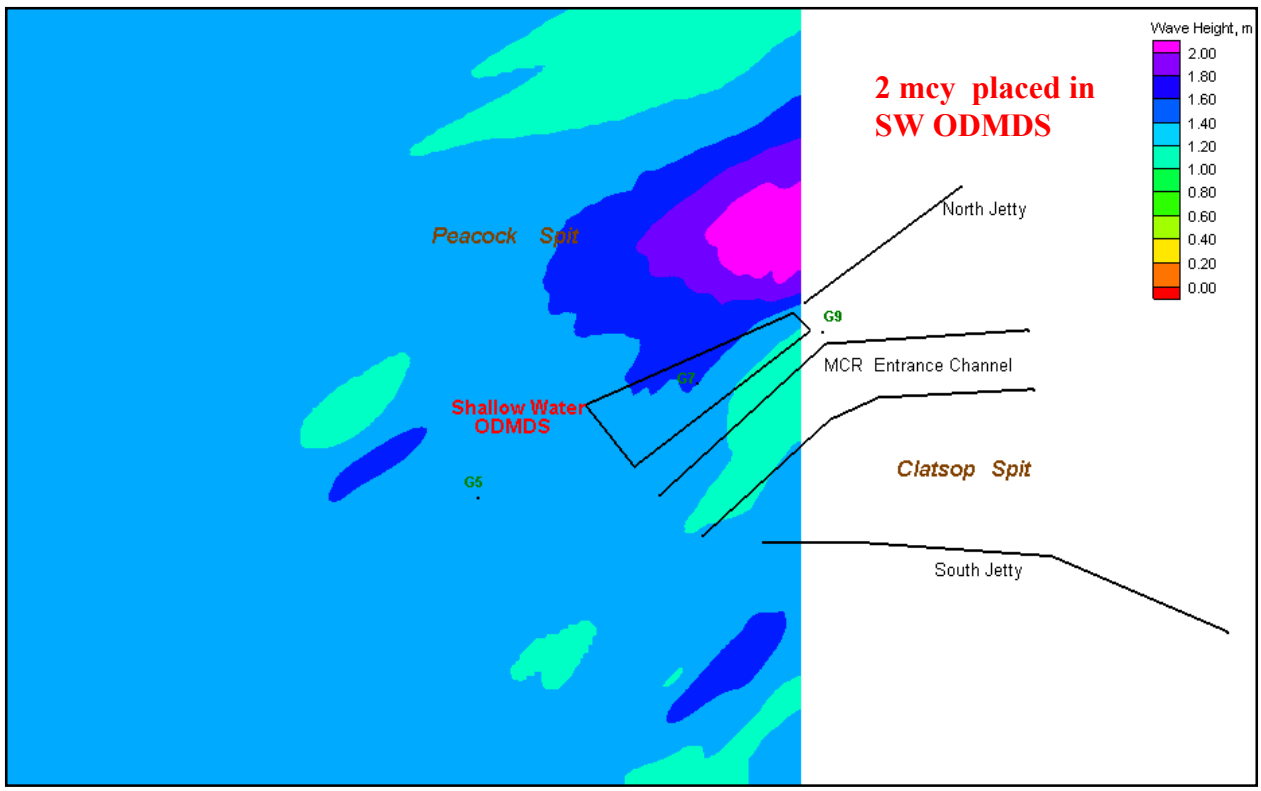
Figure M17 . Estimated wave amplification at MCR due to bathymetry change resulting from 2 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "2 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Swell: Avg. wave height = 2.85 m, peak wave period=16.7 sec, Avg. wave direction = W (280 deg), Wind=4.8 m/s @ SE (158 deg)

Figure M18. Estimated wave breaking location for 1997 (shown in black markers) and for 2 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+2 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.





Offshore wave conditions (figure S8) for Summer Swell: Ht = 1.29 m, Tp=16.7 sec, Dir =225 deg, Wind=5.4 m/s @ 316 deg

Figure M19 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2 MCY placed within SWS.

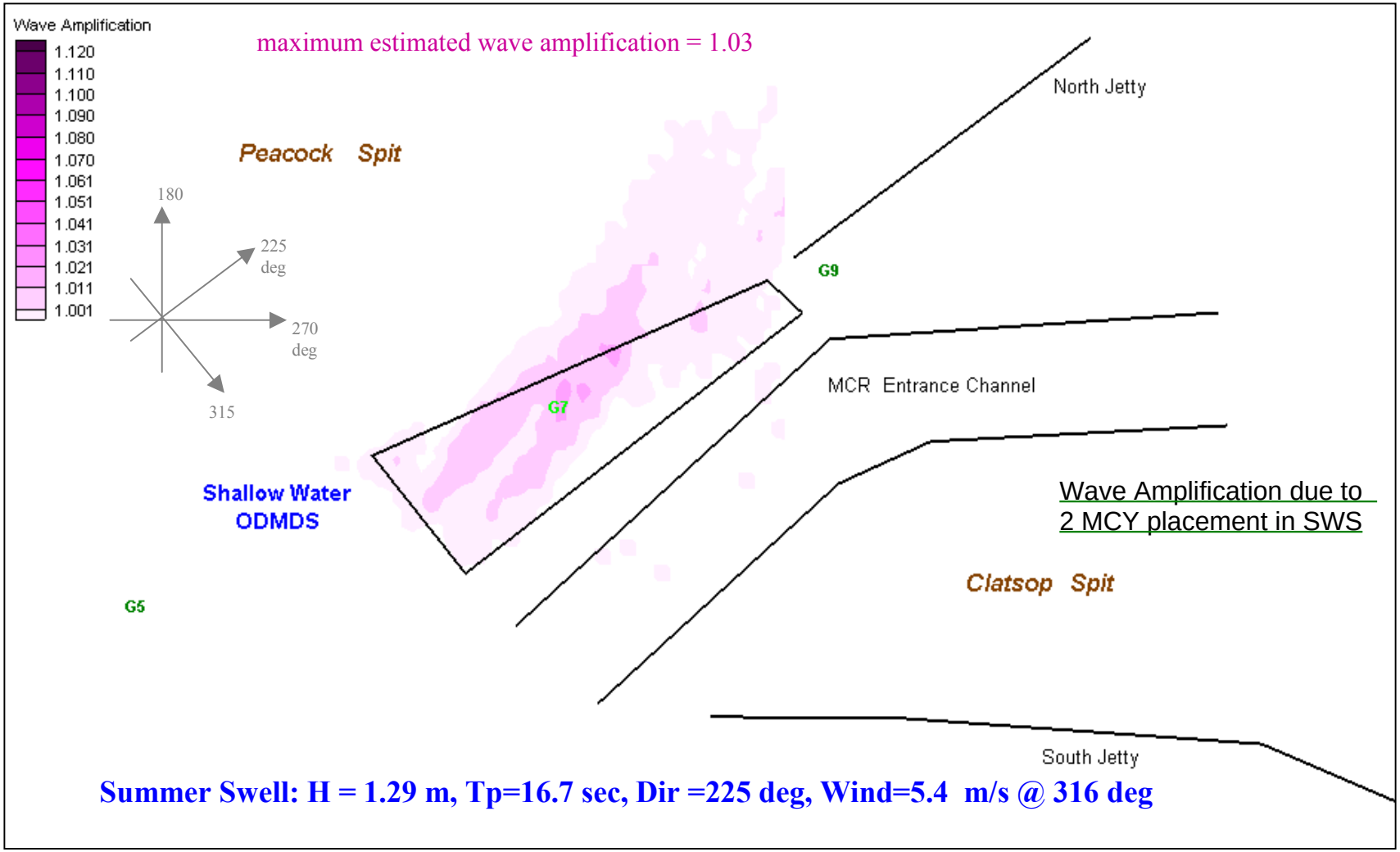
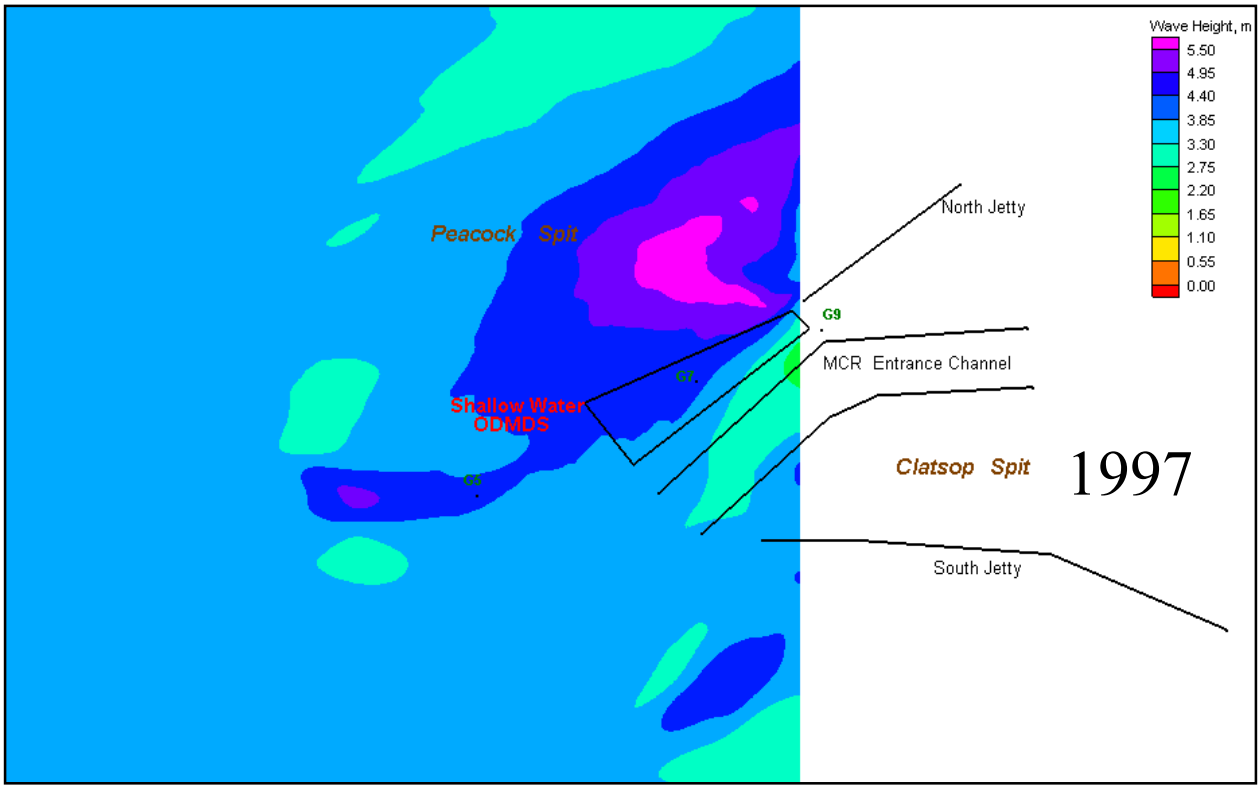
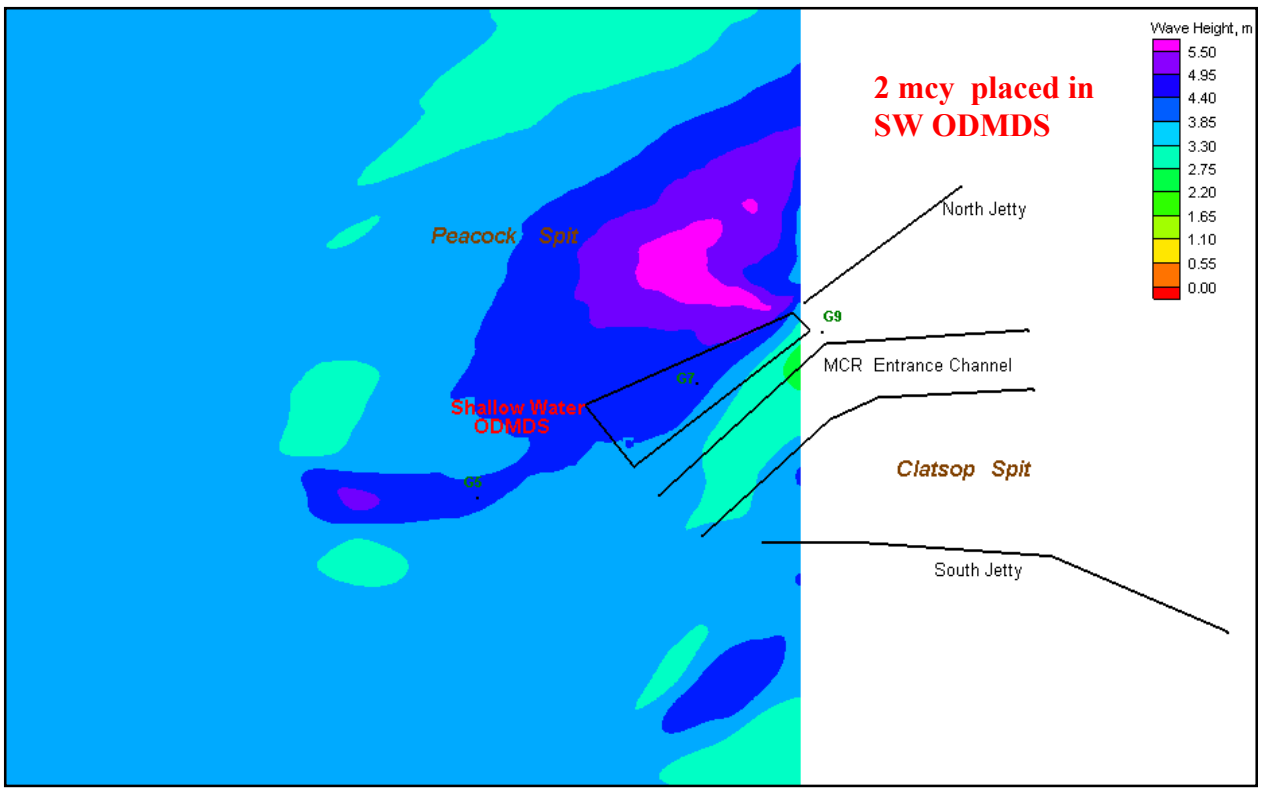


Figure M20 . Estimated wave amplification at MCR due to bathymetry change resulting from 2 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "2 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.





Offshore wave conditions (figure S9) for Winter Swell: Ht = 3.75 m, Tp=16.7 sec, Dir =275 deg, Wind=6.9 m/s @ 108 deg

Figure M21 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2 MCY placed within SWS.

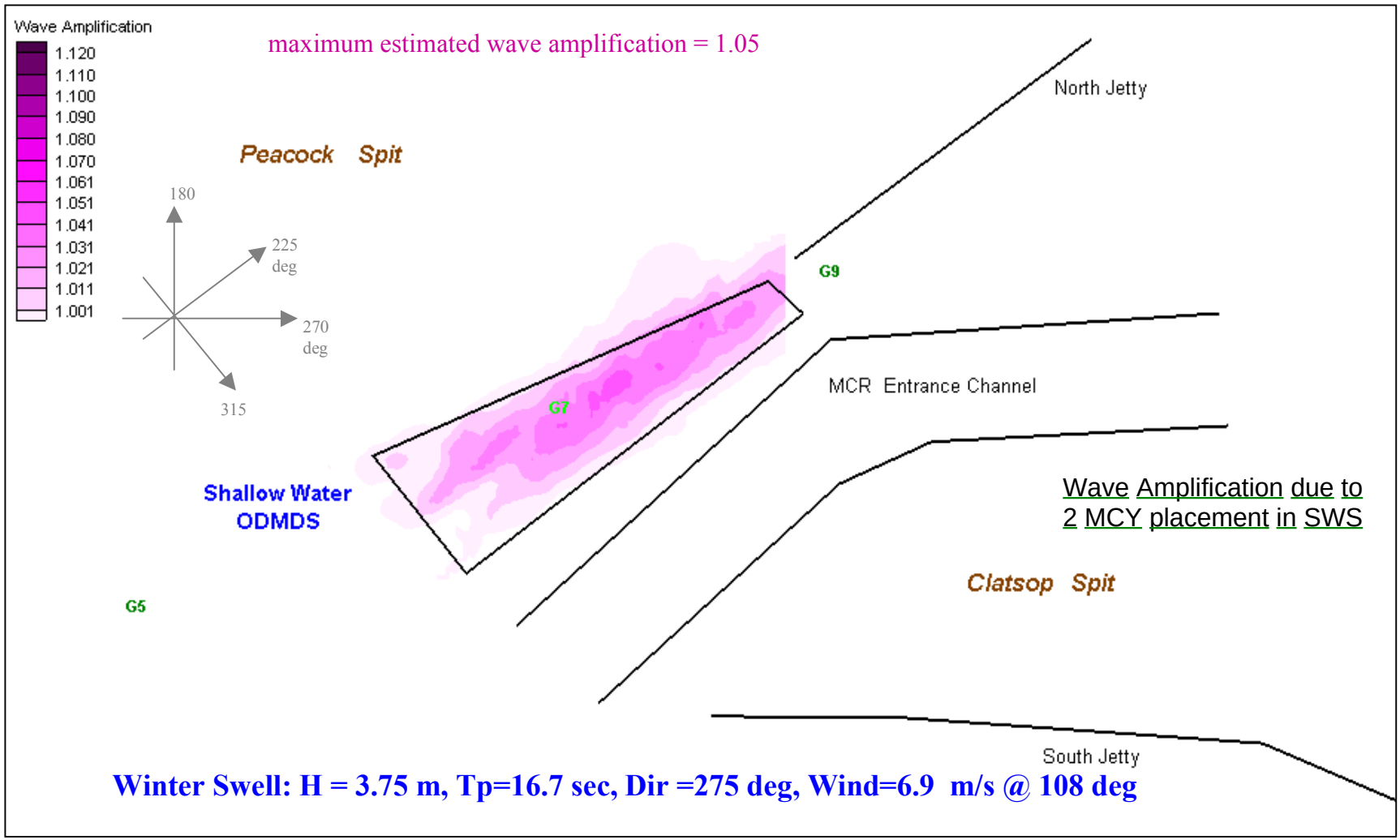
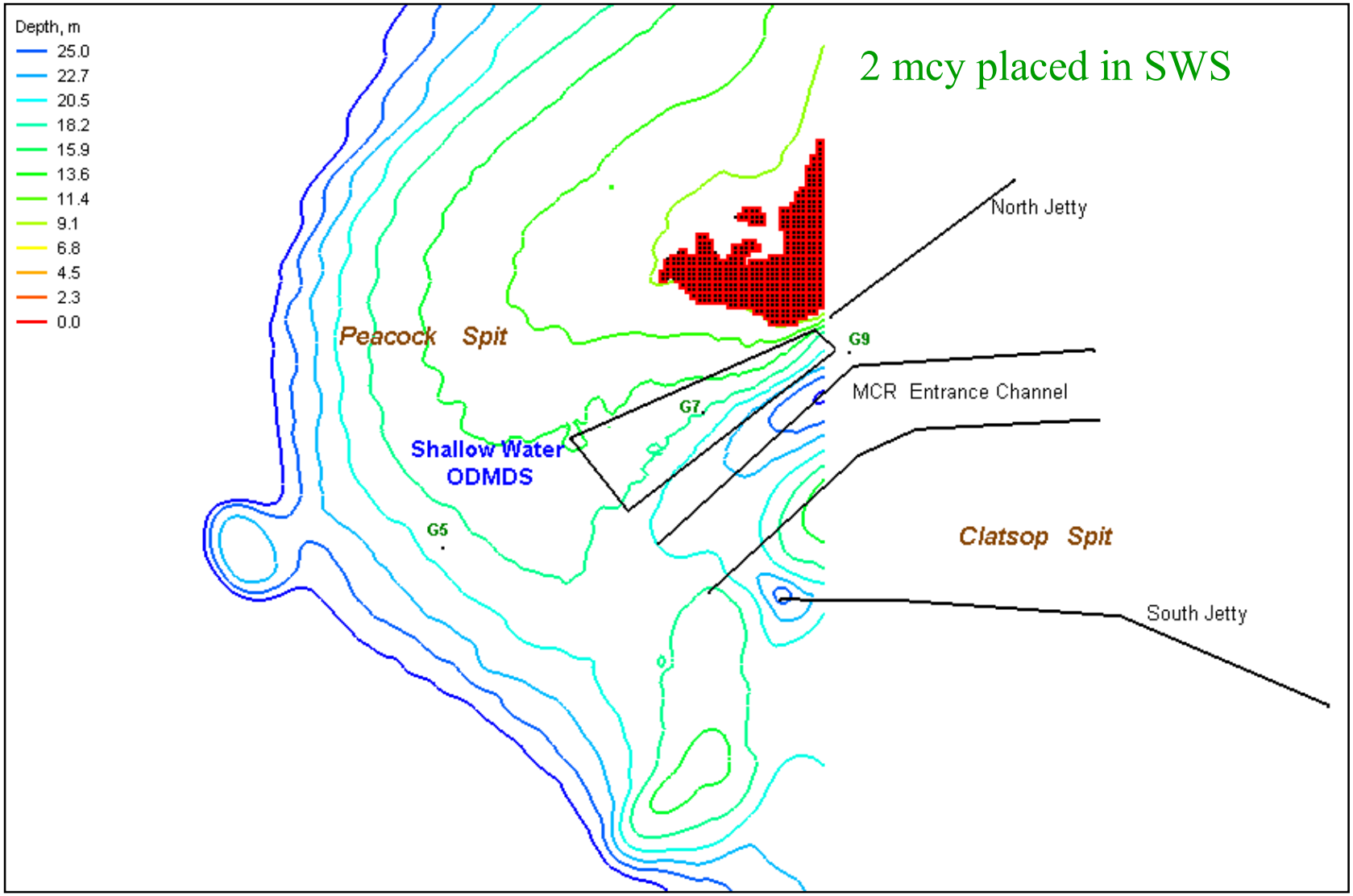
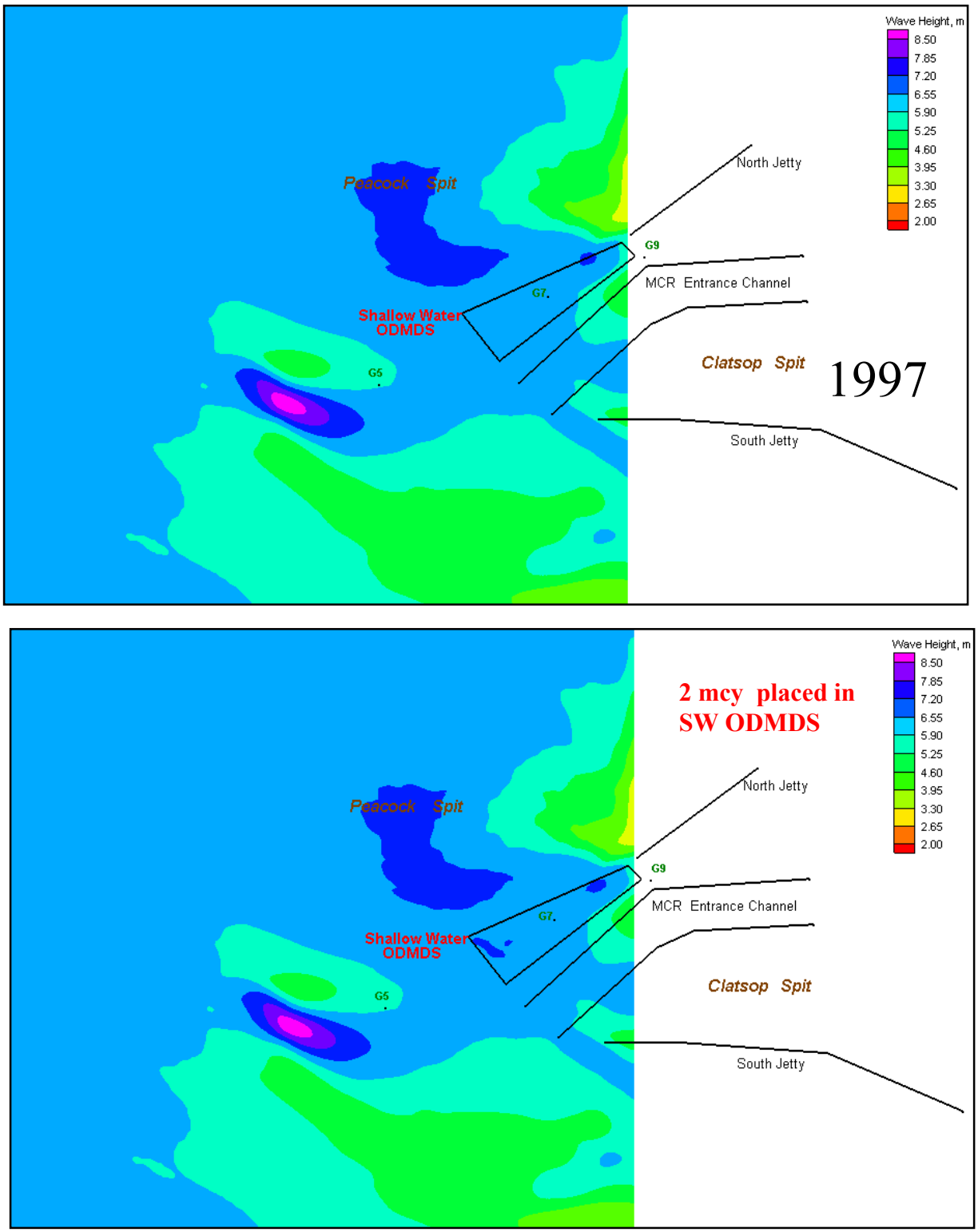


Figure M22 . Estimated wave amplification at MCR due to bathymetry change resulting from 2 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "2 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Swell: Avg. wave height= 3.75 m, peak wave period =16.7 sec, Avg. wave direction =W (275 deg), Wind=6.9 m/s @ E (108 deg)

Figure M23. Estimated wave breaking location for 1997 (shown in black markers) and for 2 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+2 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.



Offshore wave conditions (figure S10) for Winter Storm: Ht = 6.55 m, Tp=14.0 sec, Dir =310 deg, Wind=10.4 m/s @ 294 deg

Figure M24 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2 MCY placed within SWS.

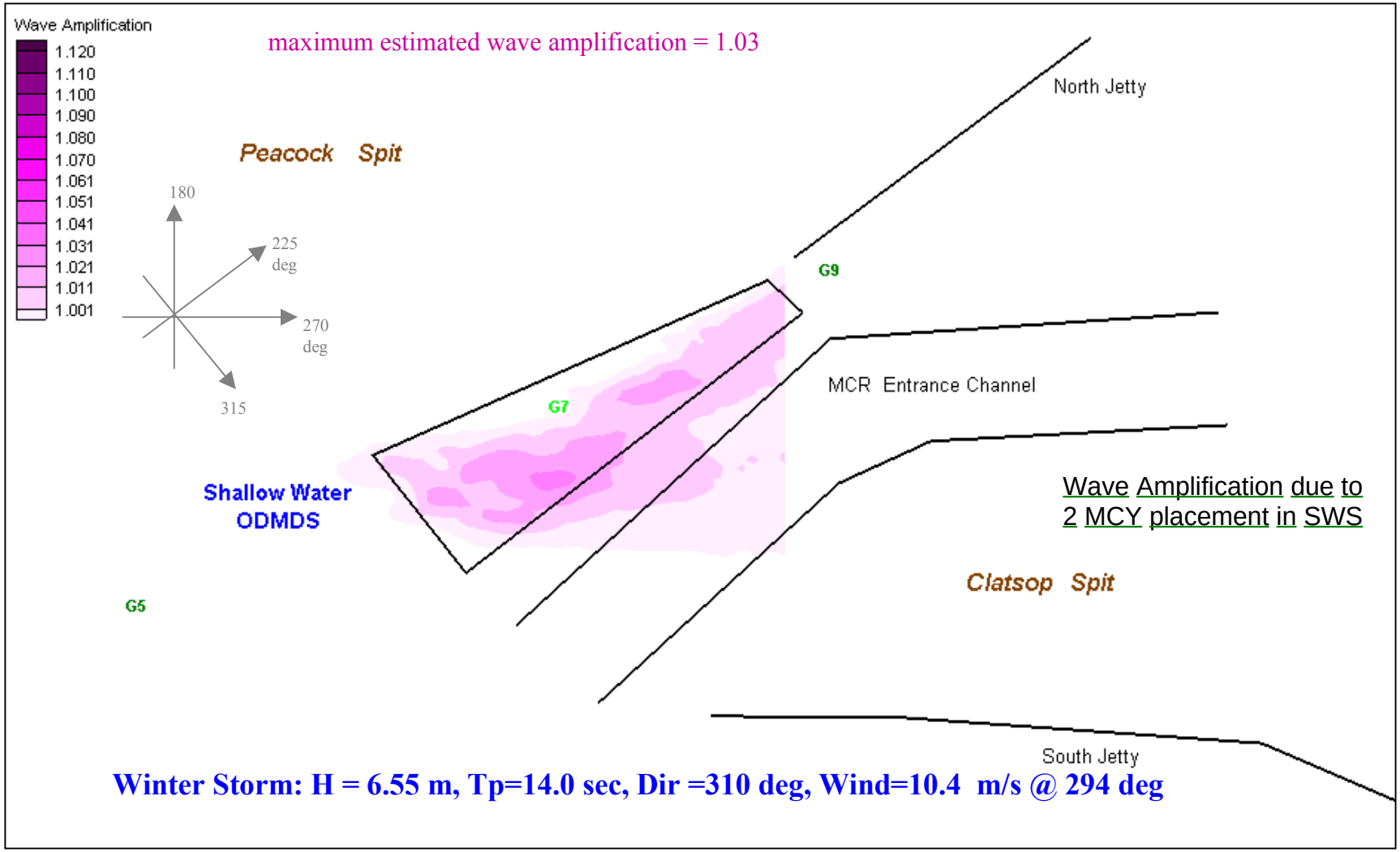
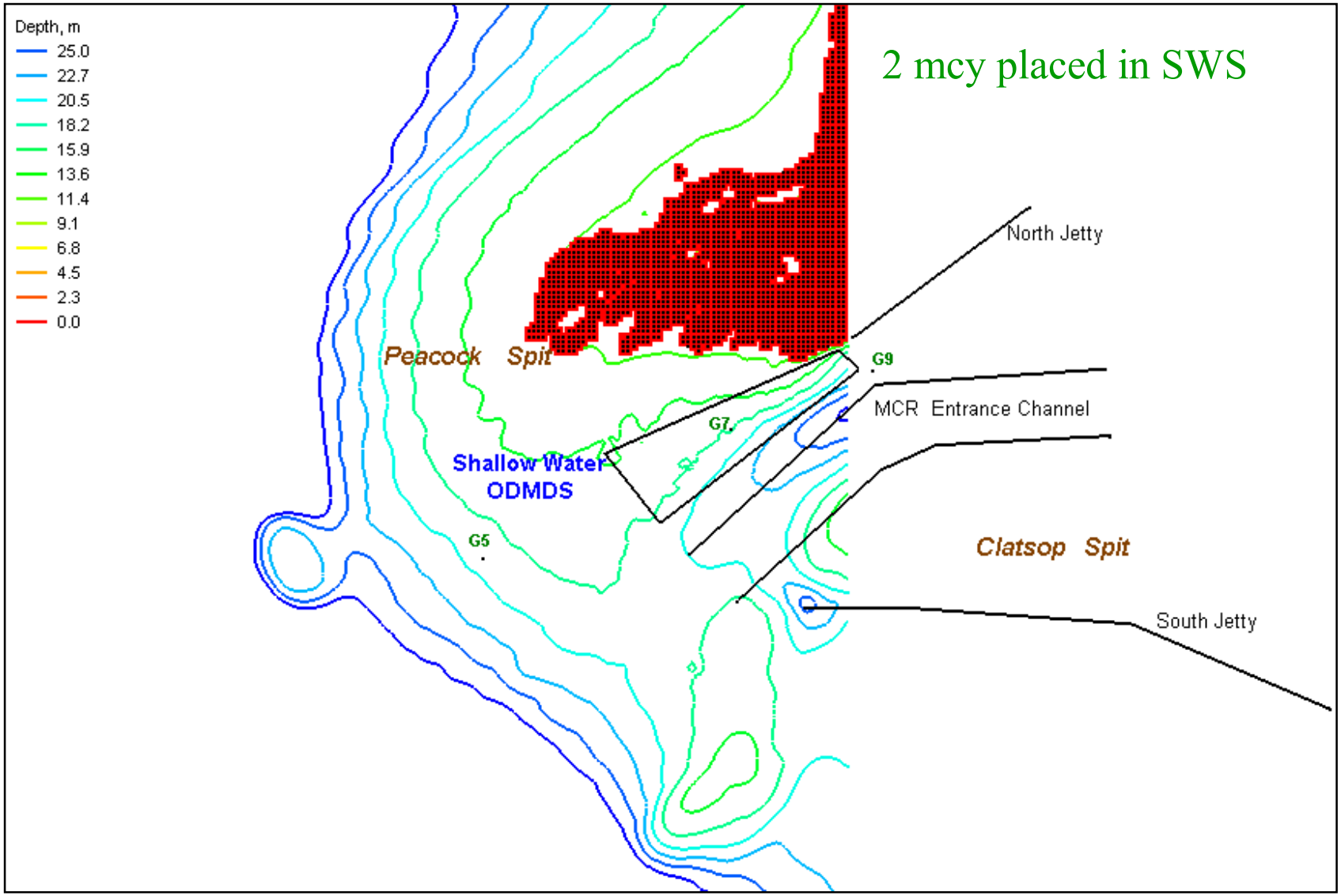
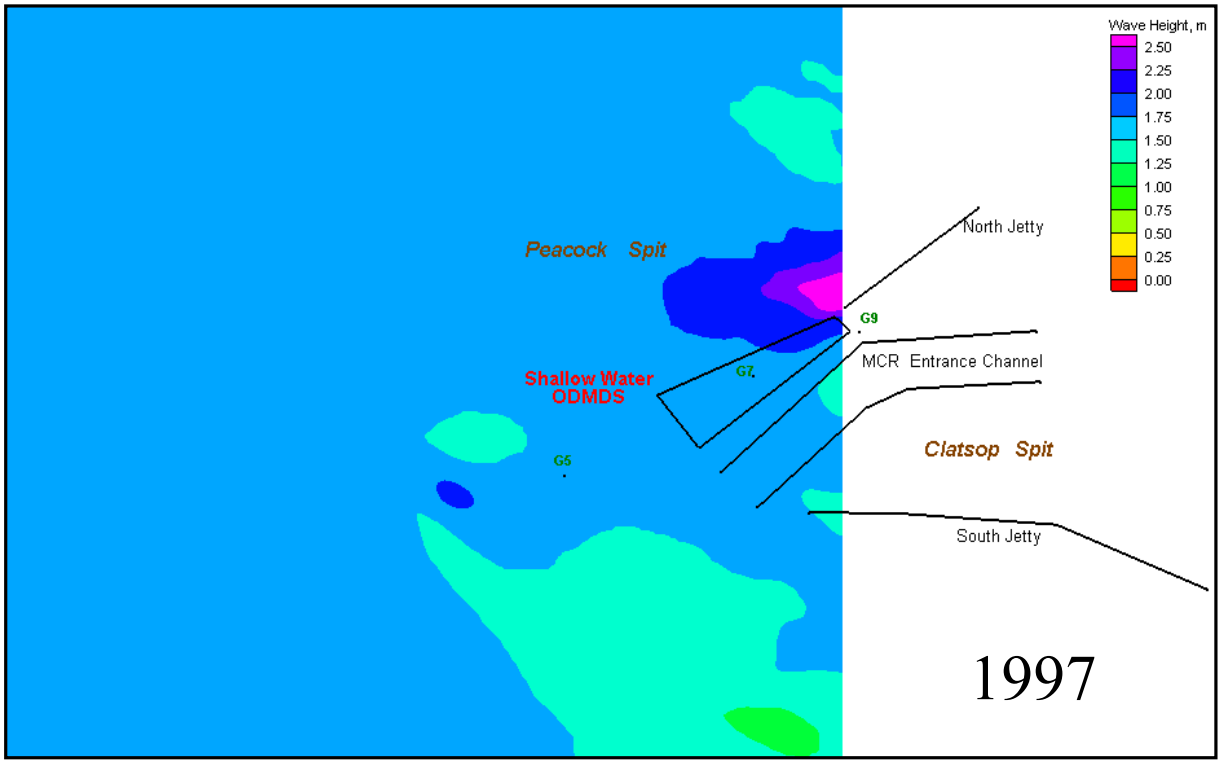


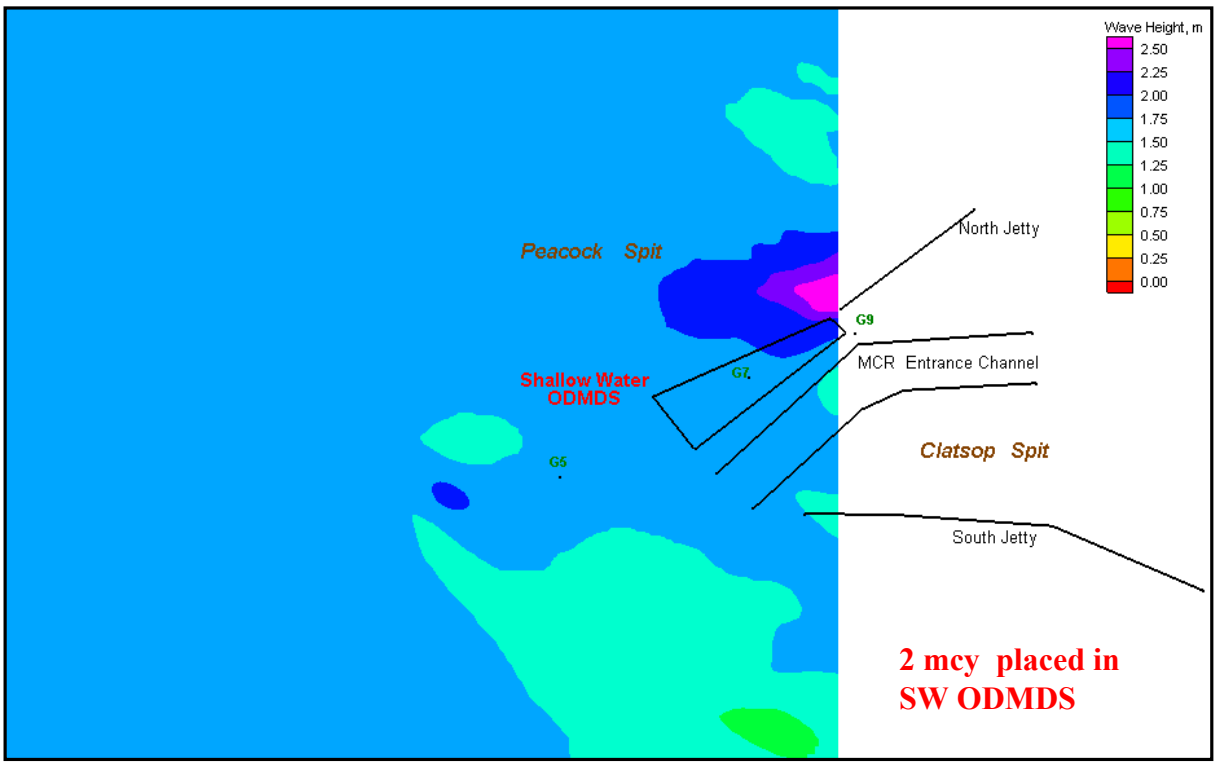
Figure M25 . Estimated wave amplification at MCR due to bathymetry change resulting from 2 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "2 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Storm: Avg. wave height = 6.55 m, peak wave period =14.0 sec, Avg. wave direction = NW (310 deg), Wind=10.4 m/s @ NW (294 deg)

Figure M26. Estimated wave breaking location for 1997 (shown in black markers) and for 2 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+2 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.





Offshore wave conditions (figure S11) for Summer Swell: Ht = 1.77 m, Tp=8.3 sec, Dir =305 deg, Wind=2.1 m/s @ 334 deg

Figure M27. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2 MCY placed within SWS.

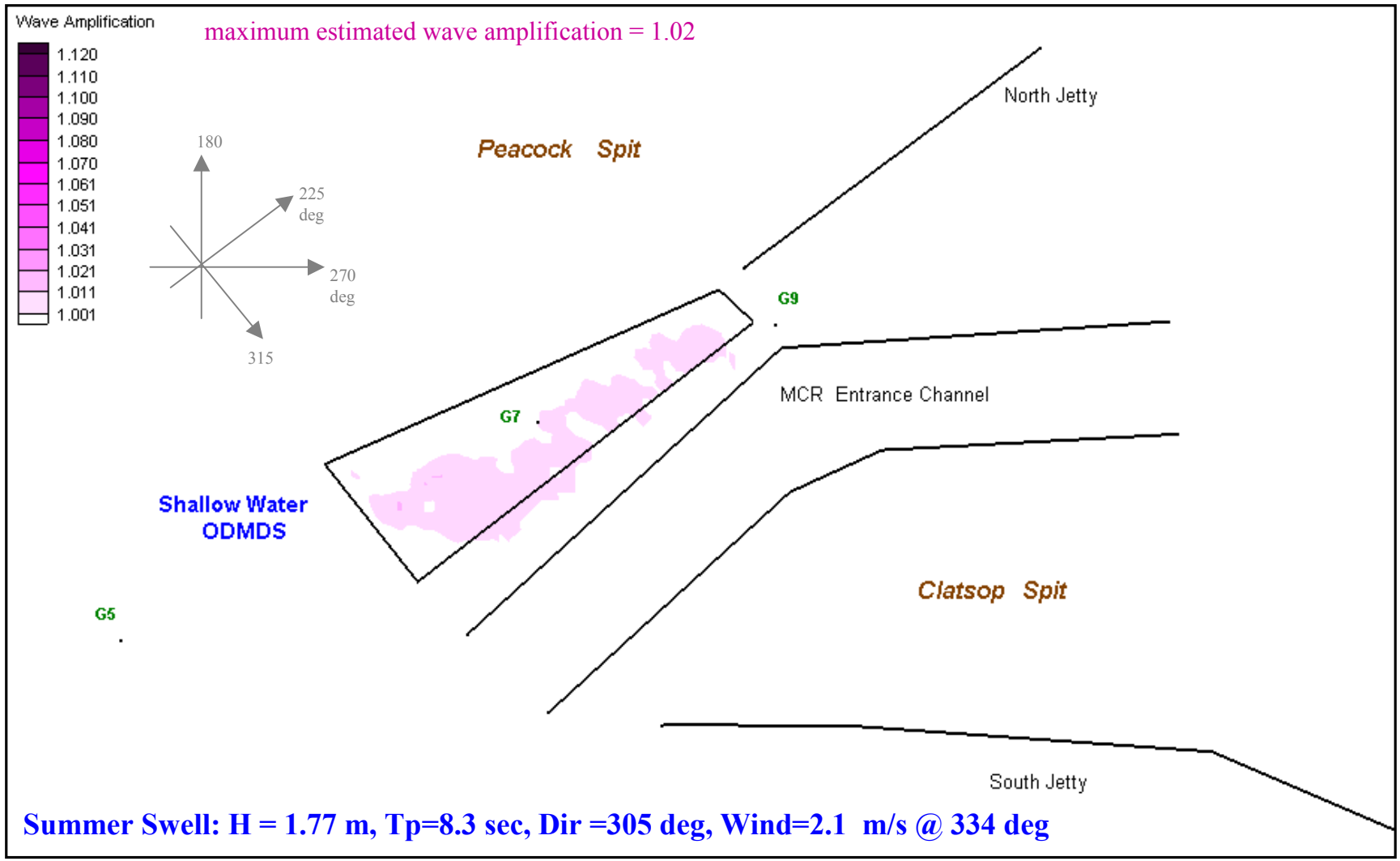


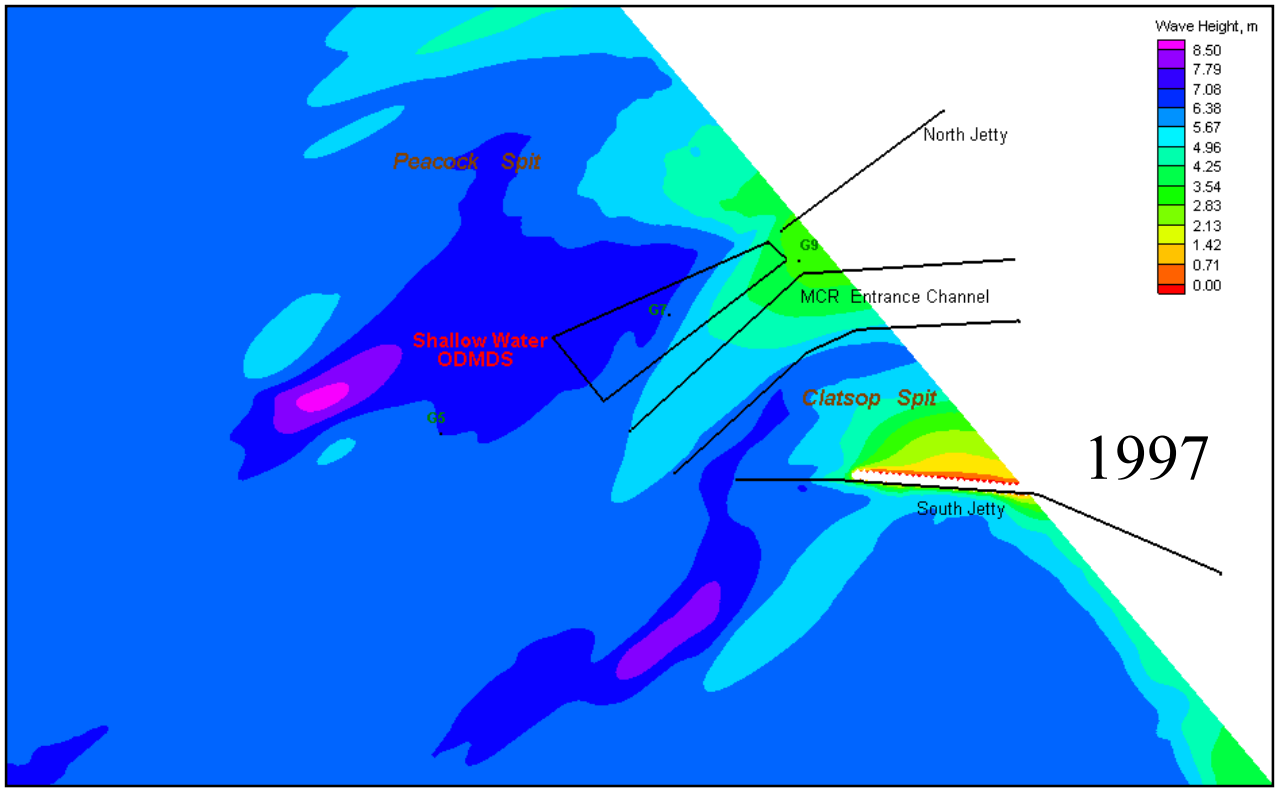
Figure M28 . Estimated wave amplification at MCR due to bathymetry change resulting from 2 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "2 million cy placement wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves for the 2 million cy placement scenario were estimated to be 20% greater than in 1997.

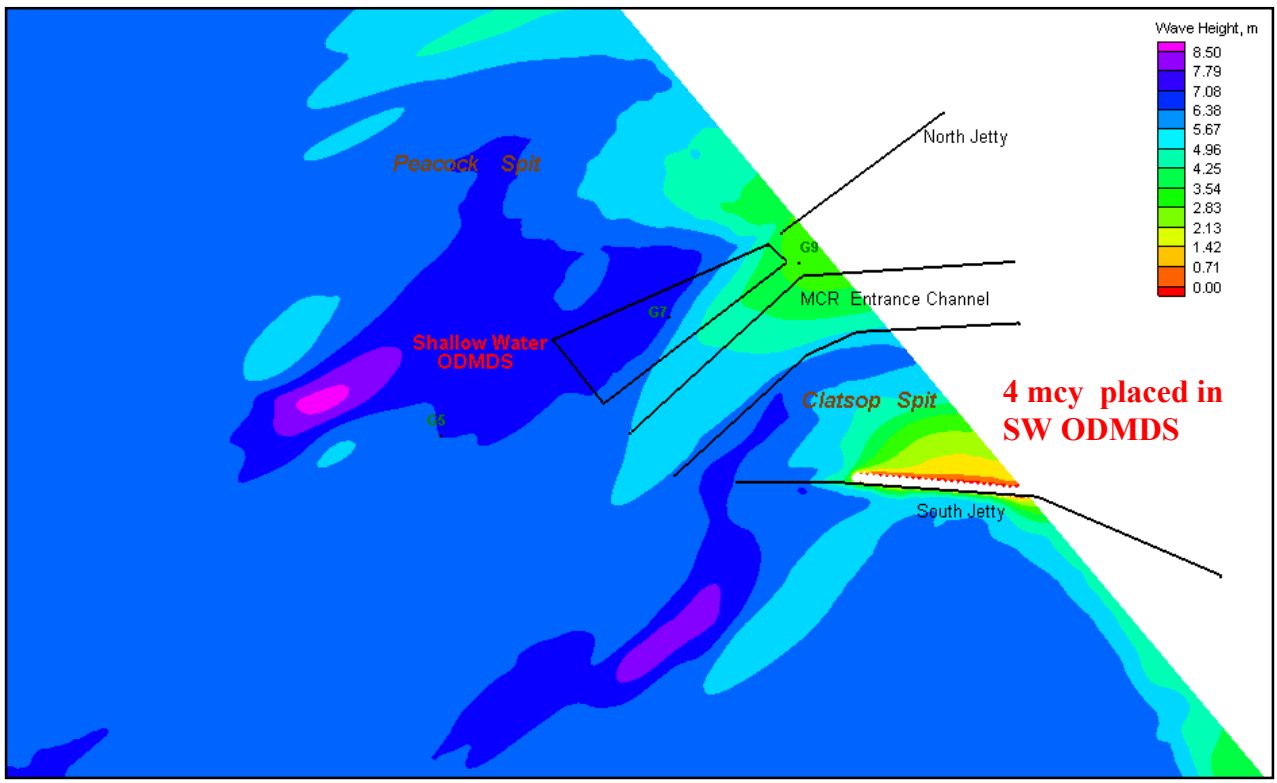
South-Southwest Wave Scenarios for Assessing **4 million cy placement** within Shallow Water ODMDS – Compared to 1997 Baseline Condition

Change in Wave Height

Changes in Wave Amplification

Changes in Wave Breaking





Offshore wave conditions (figure S1) for <u>Winter Storm</u>: Ht= 6.48 m, Tp=12.5 sec, Dir =225 deg, Wind=13.8 m/s @ 180 deg

Figure M29 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 4 MCY placed within SWS.

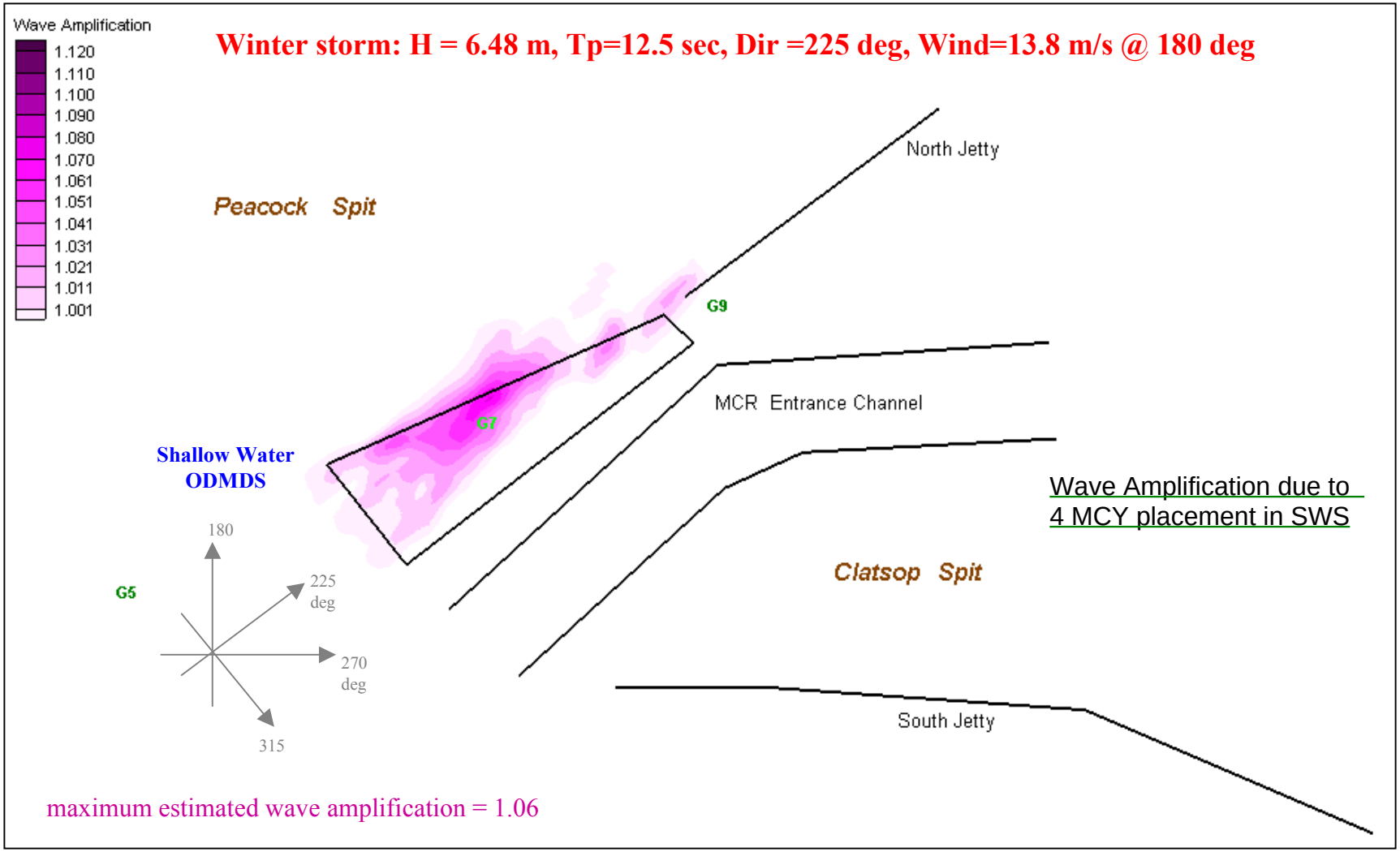
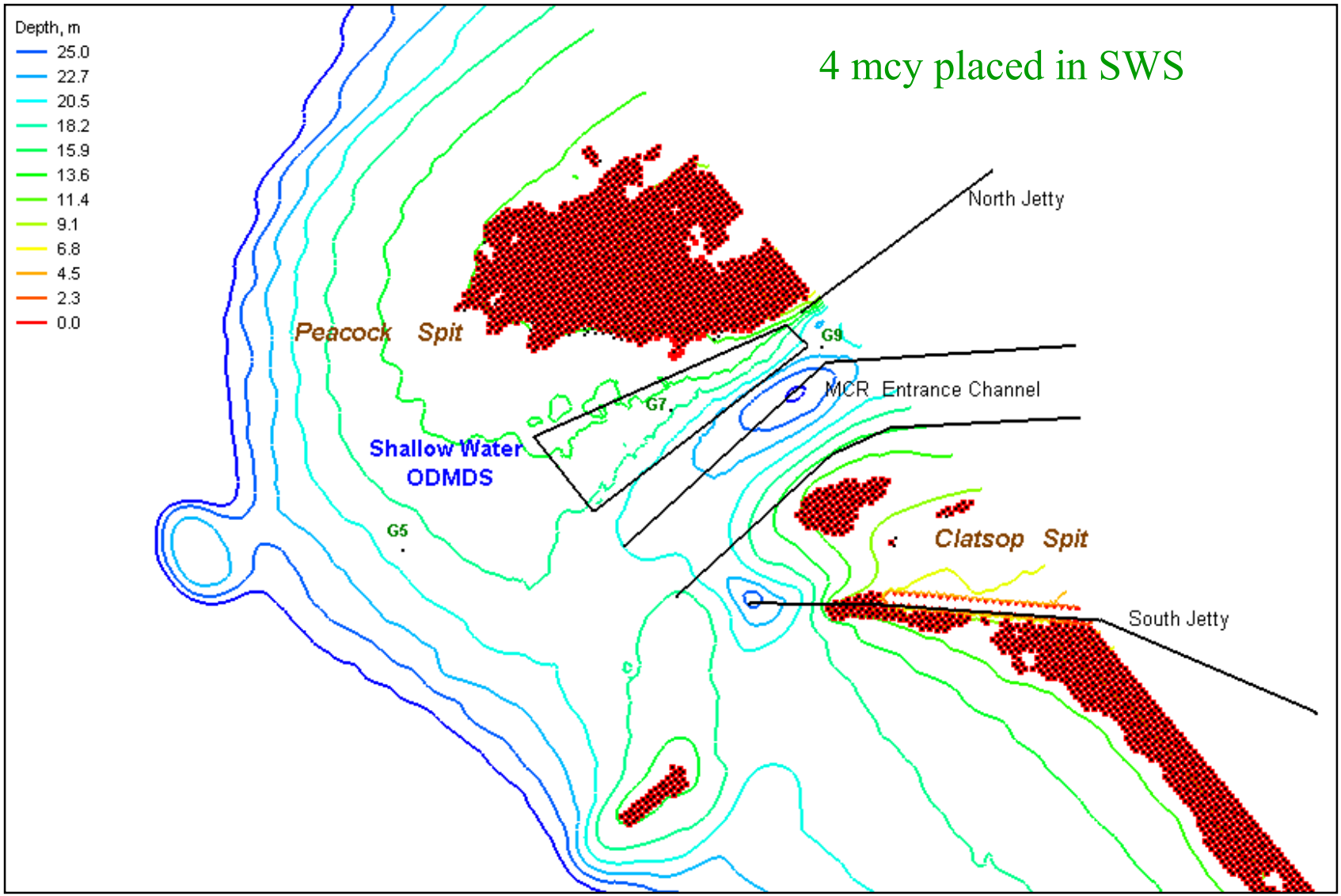
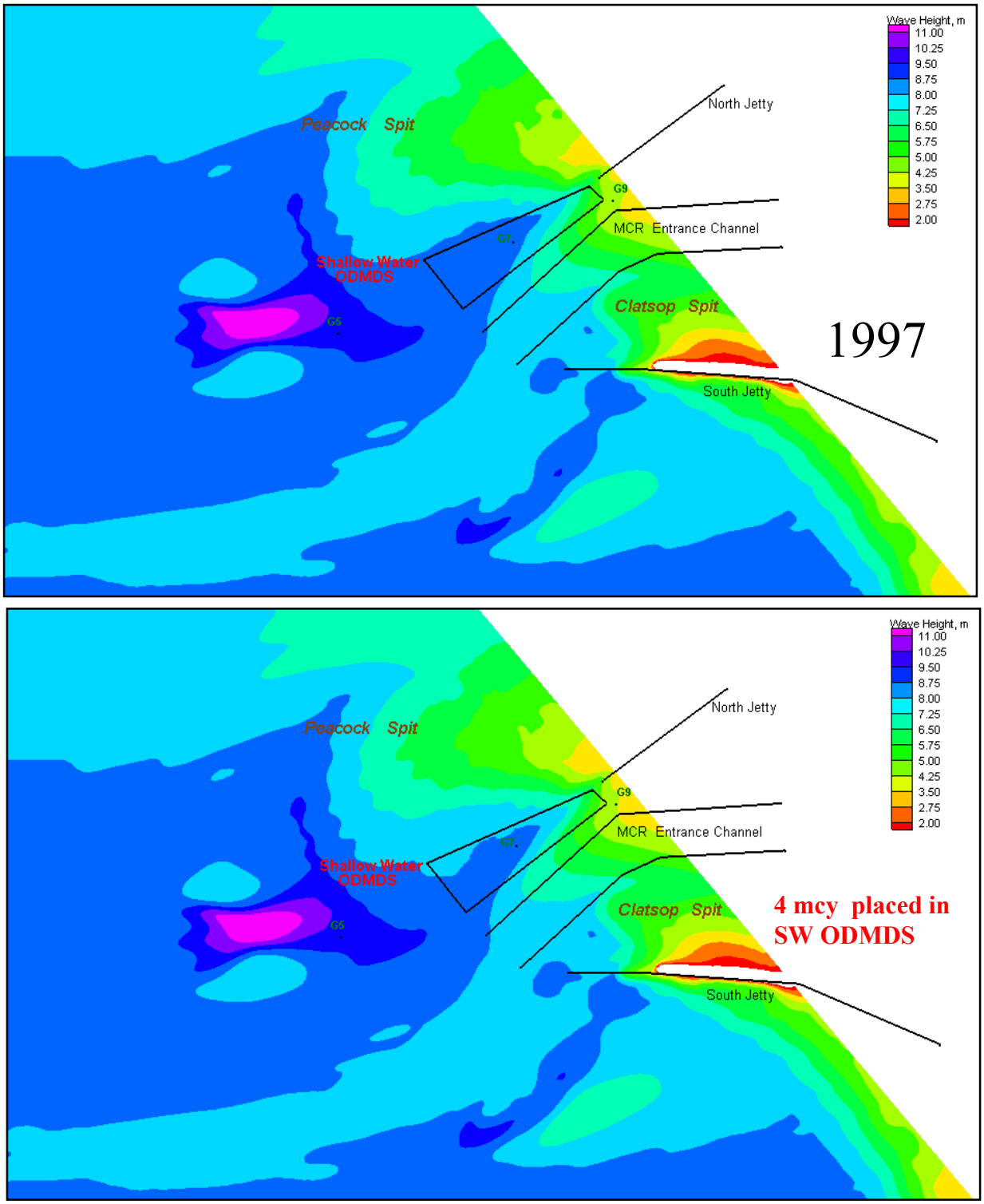


Figure M30 . Estimated wave amplification at MCR due to bathymetry change resulting from 4 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "4 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Storm: Avg. wave height = 6.48 m, Peak wave period =12.5 sec, Avg. wave direction = SW (225 deg), Wind=13.8 m/s @ S (180 deg)

Figure M31. Estimated wave breaking location for 1997 (shown in black markers) and for 4 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+4 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.



Offshore wave conditions (figure S2) for <u>Winter Storm</u>: Ht = 8.34 m, Tp=16.7 sec, Dir =260 deg, Wind=14.2 m/s @ 192 deg

Figure M32. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 4 MCY placed within SWS.

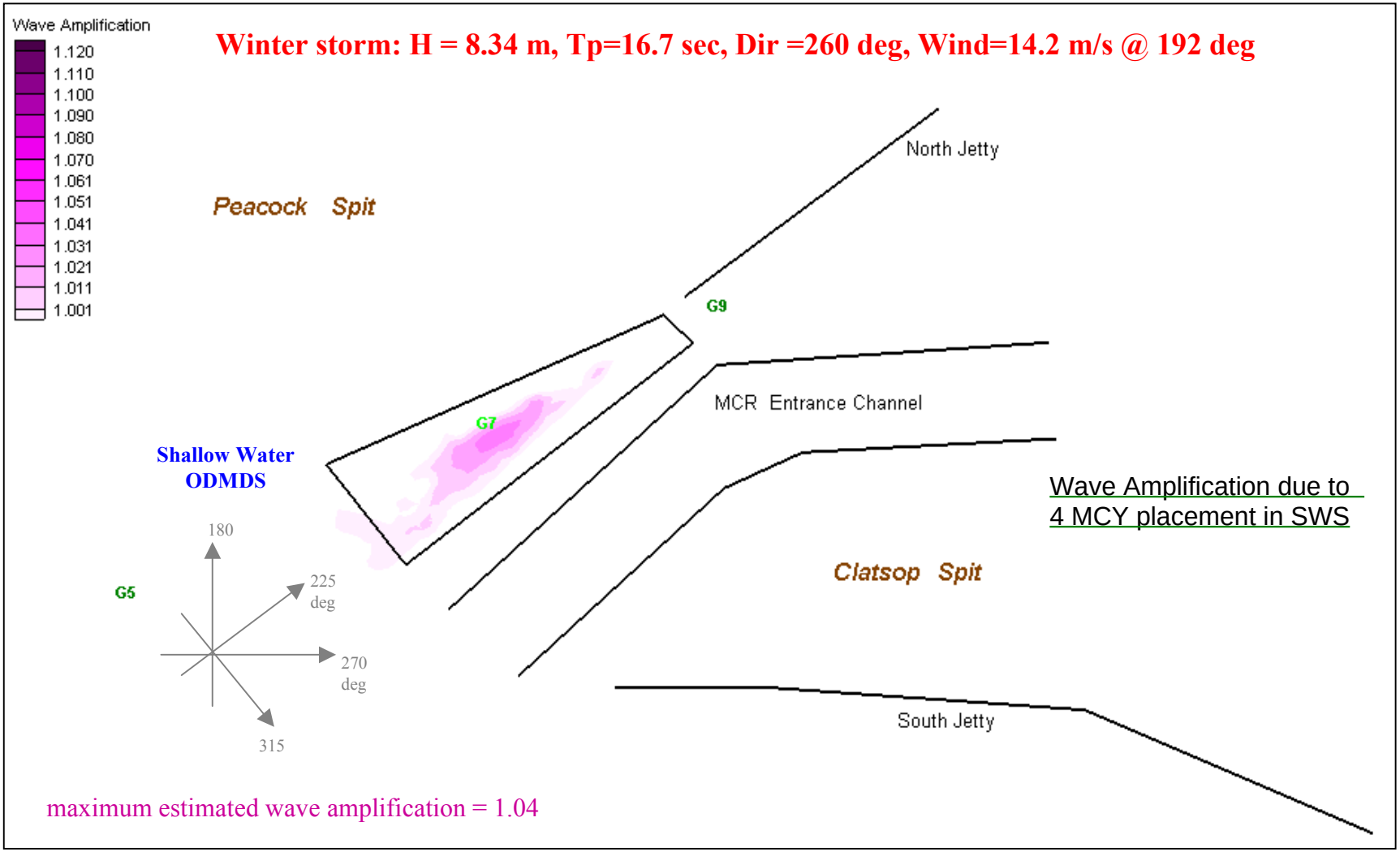
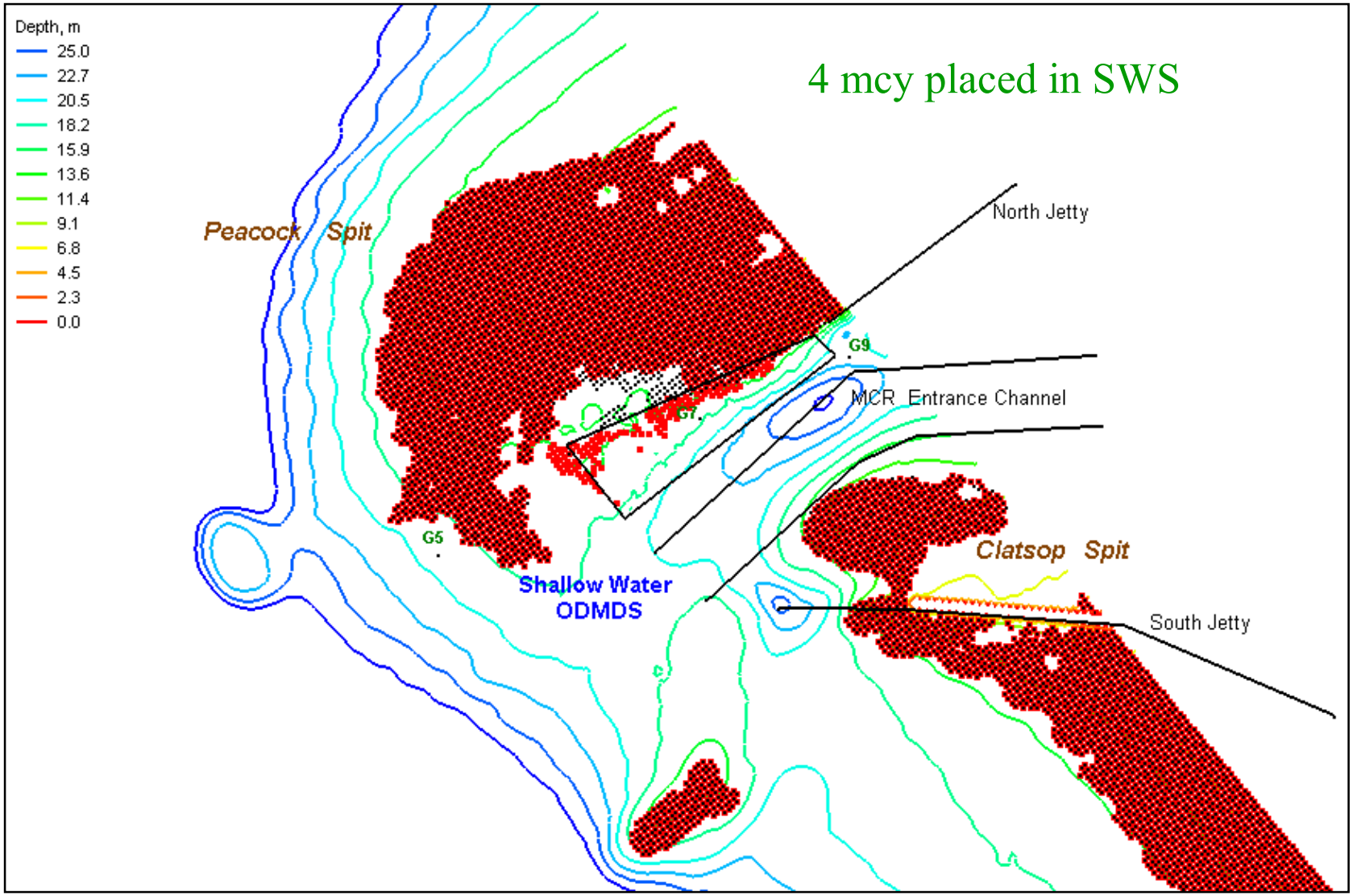
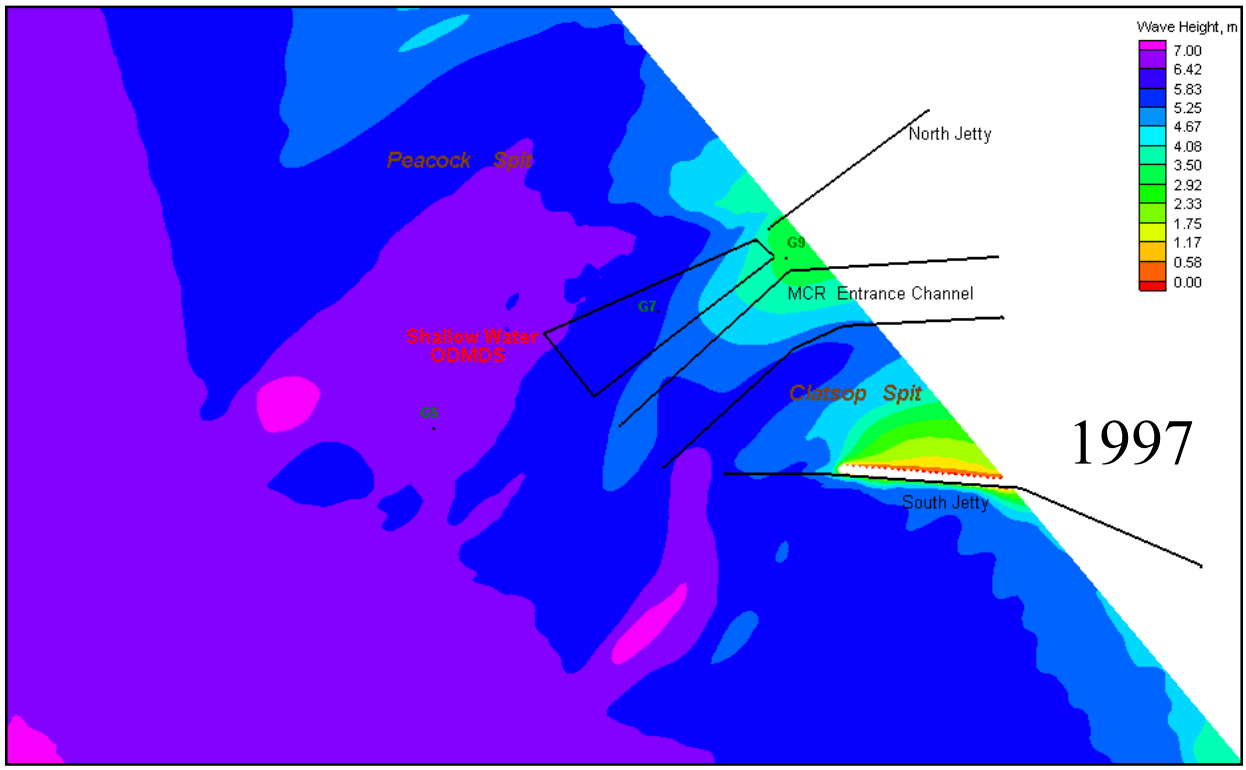


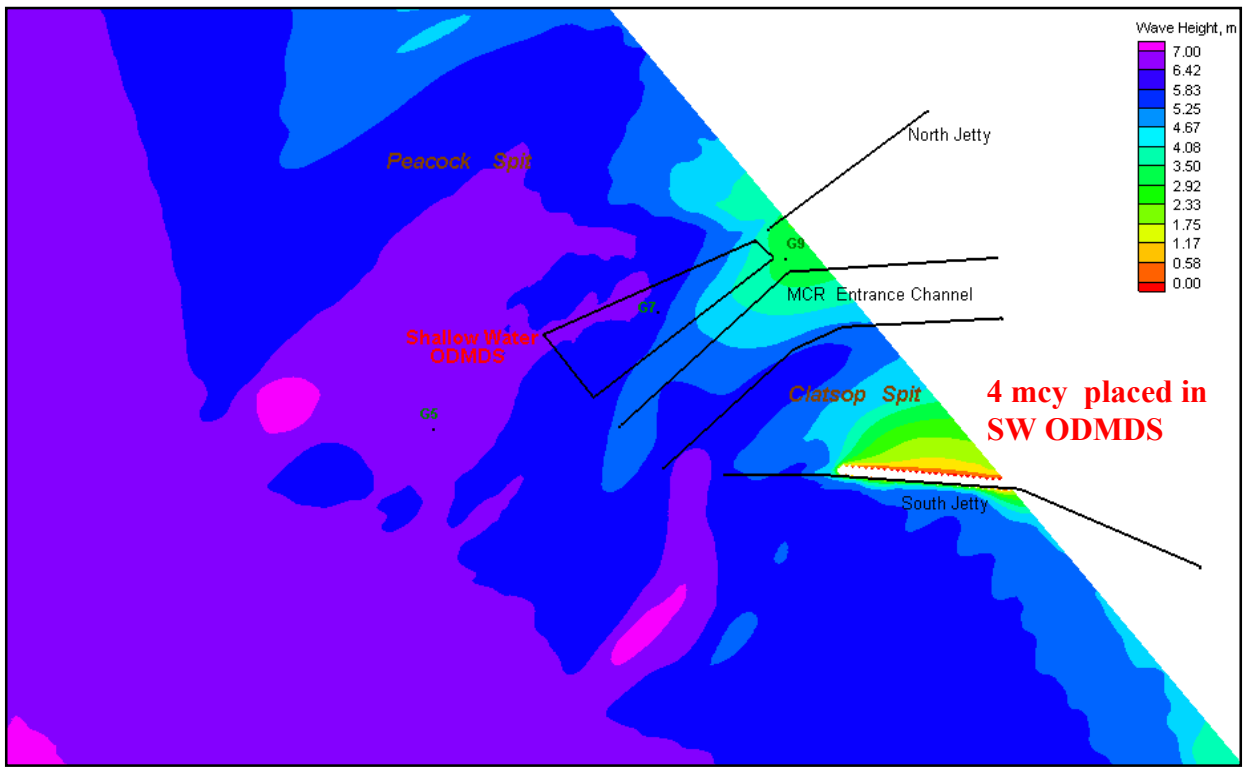
Figure M33 . Estimated wave amplification at MCR due to bathymetry change resulting from 4 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "4 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Storm: Avg. wave height = 8.34 m, Peak wave period=16.7 sec, Avg. wave direction =W (260 deg), Wind=14.2 m/s @ S (192 deg)

Figure M34. Estimated wave breaking location for 1997 (shown in black markers) and for 4 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+4 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.





Offshore wave conditions (figure S3) for <u>Winter Storm</u>: Ht = 6.78 m, Tp=10.5 sec, Dir =210 deg, Wind=14.8 m/s @ 190 deg

Figure M35 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 4 MCY placed within SWS.

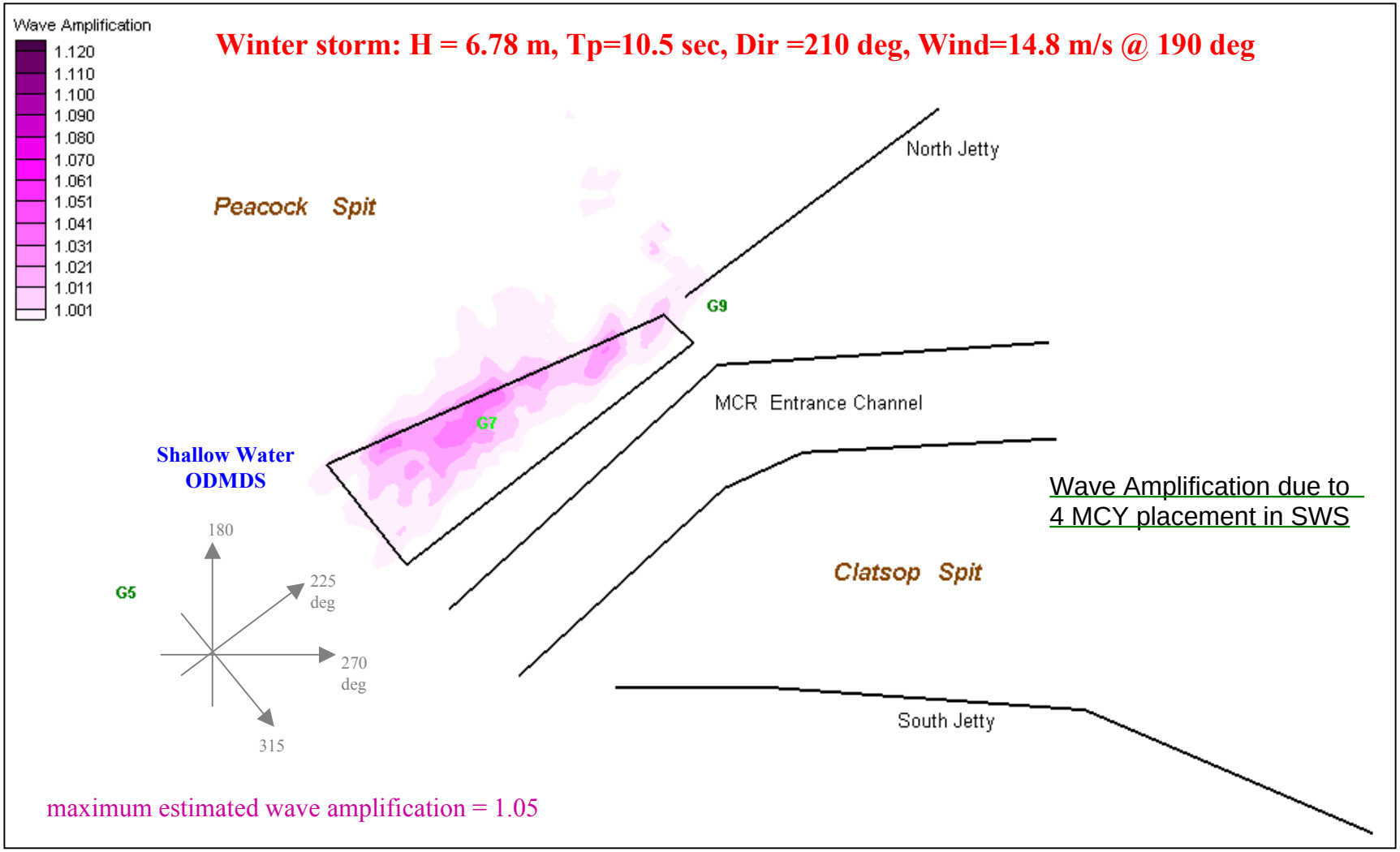
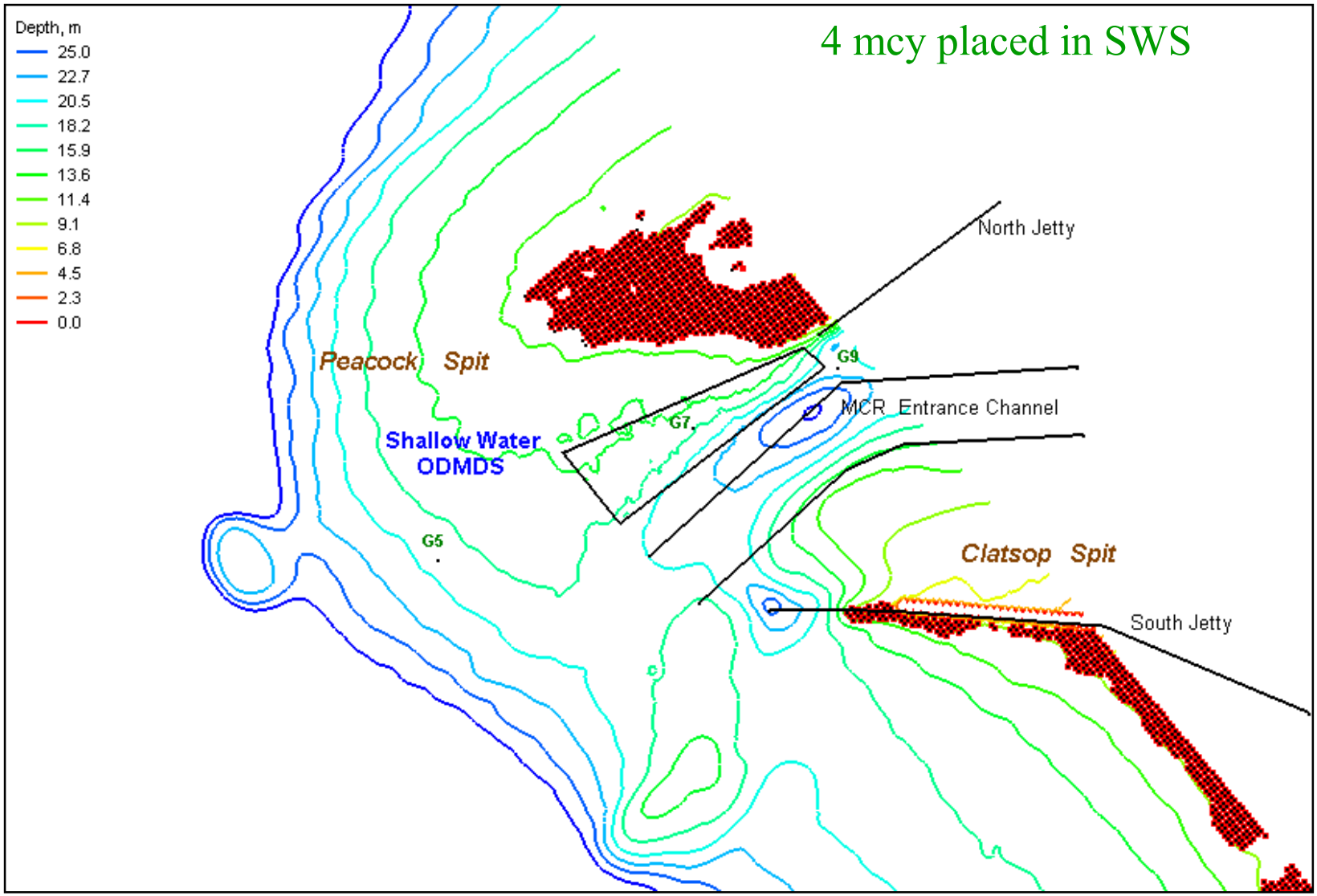
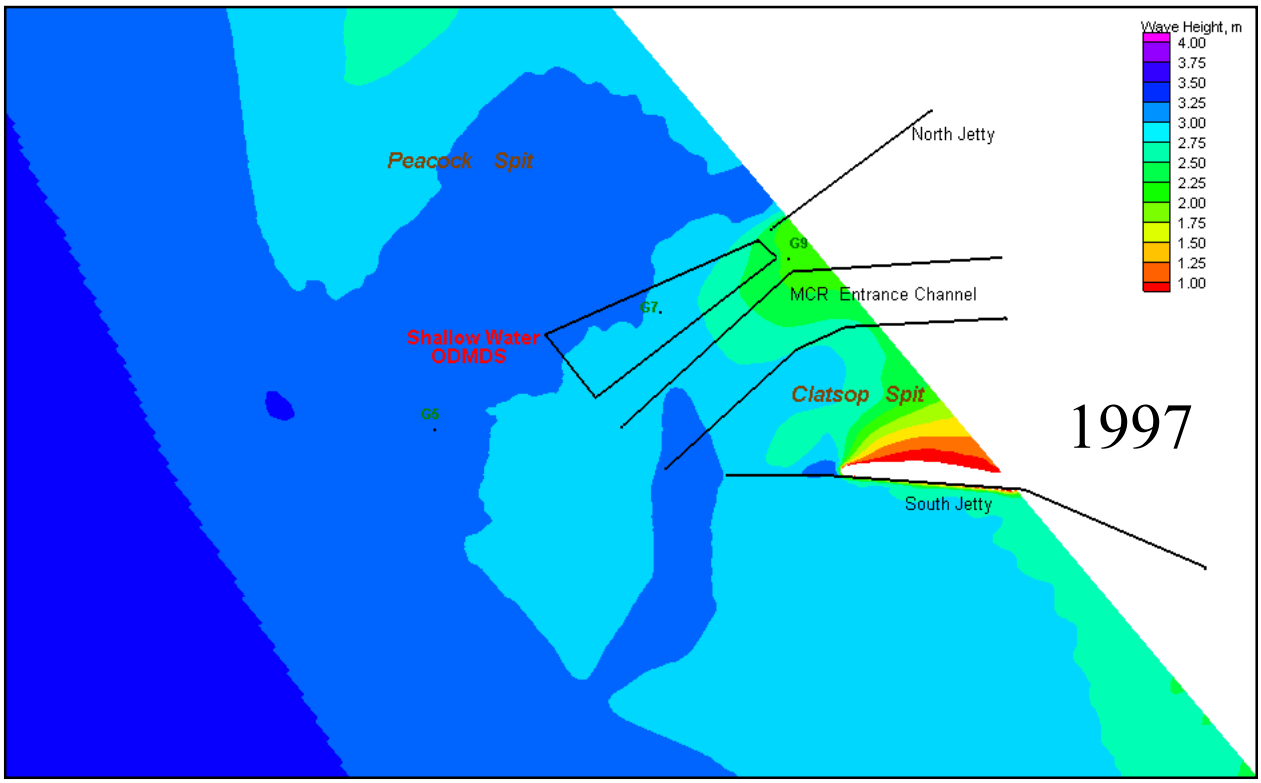


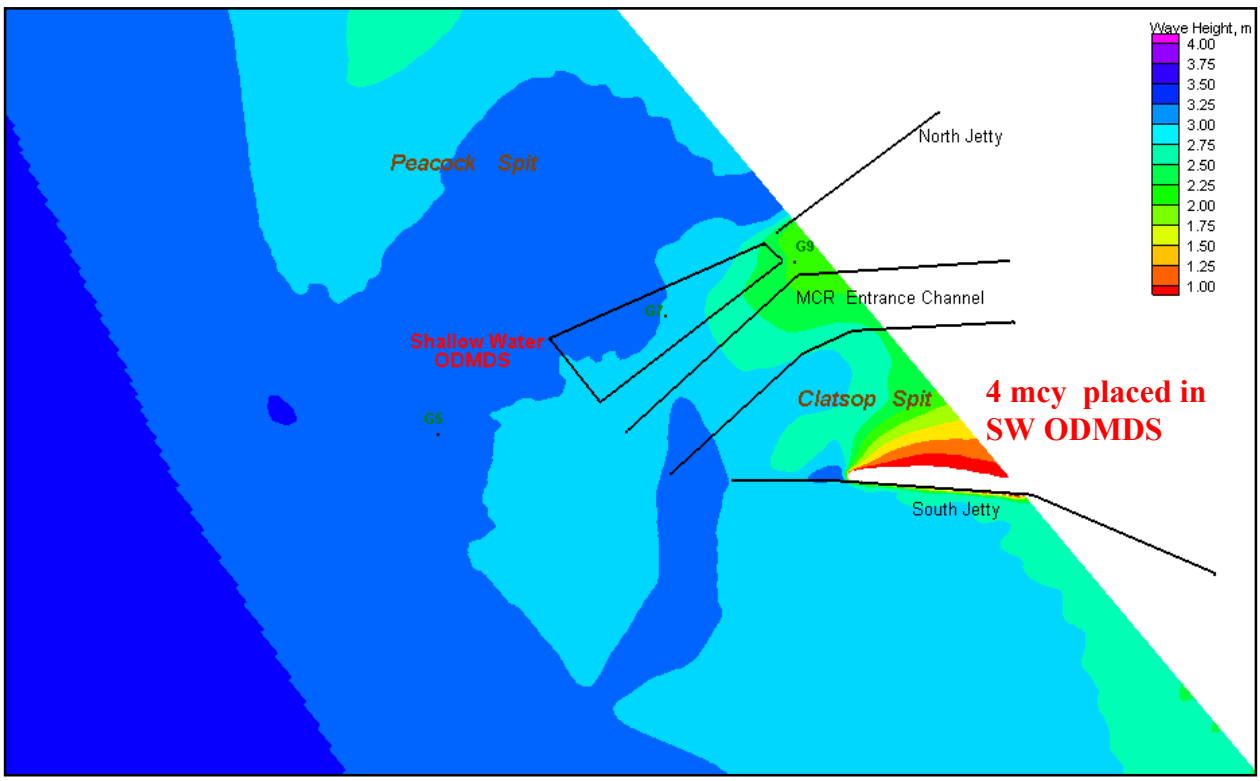
Figure M36 . Estimated wave amplification at MCR due to bathymetry change resulting from 4 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "4 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Storm: Avg. wave height = 6.76 m, Peak wave period =10.5 sec, Avg. wave direction=SW (210 deg), Wind=13.8 m/s @ S (180 deg)

Figure M37. Estimated wave breaking location for 1997 (shown in black markers) and for 4 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+4 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.





Offshore wave conditions (figure S4) for <u>Summer Storm</u>: Ht = 3.56 m, Tp=7.7 sec, Dir =200 deg, Wind=10.6 m/s @ 178 deg

Figure M38. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 4 MCY placed within SWS.

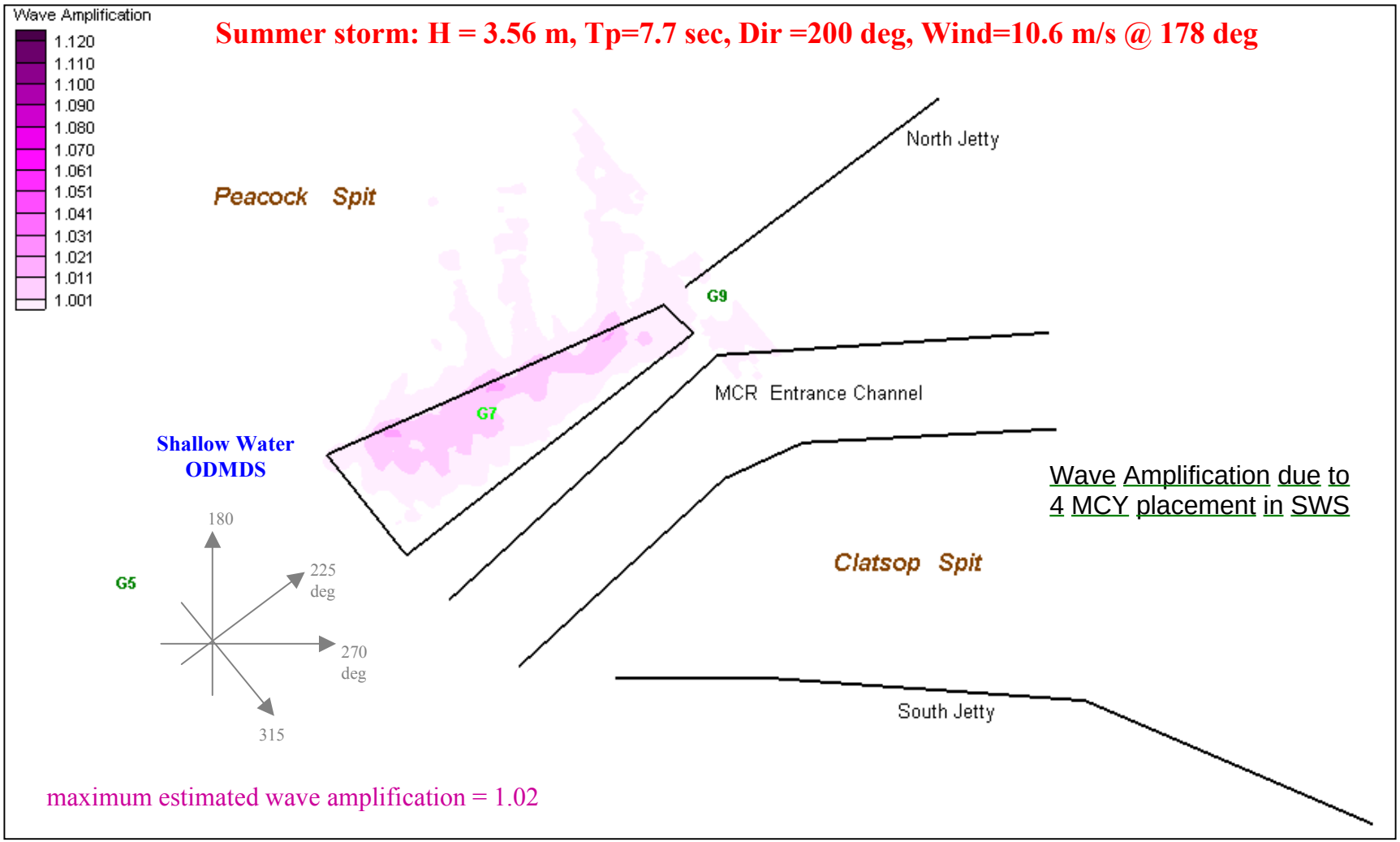
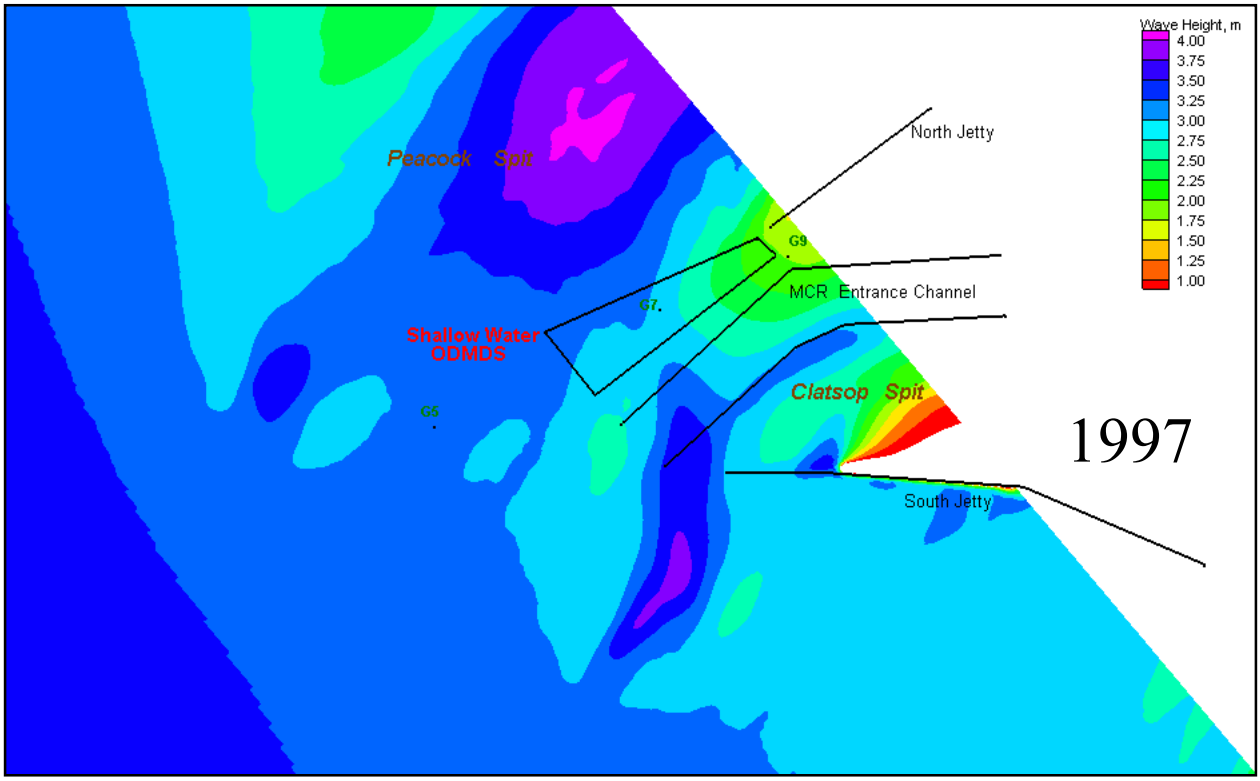
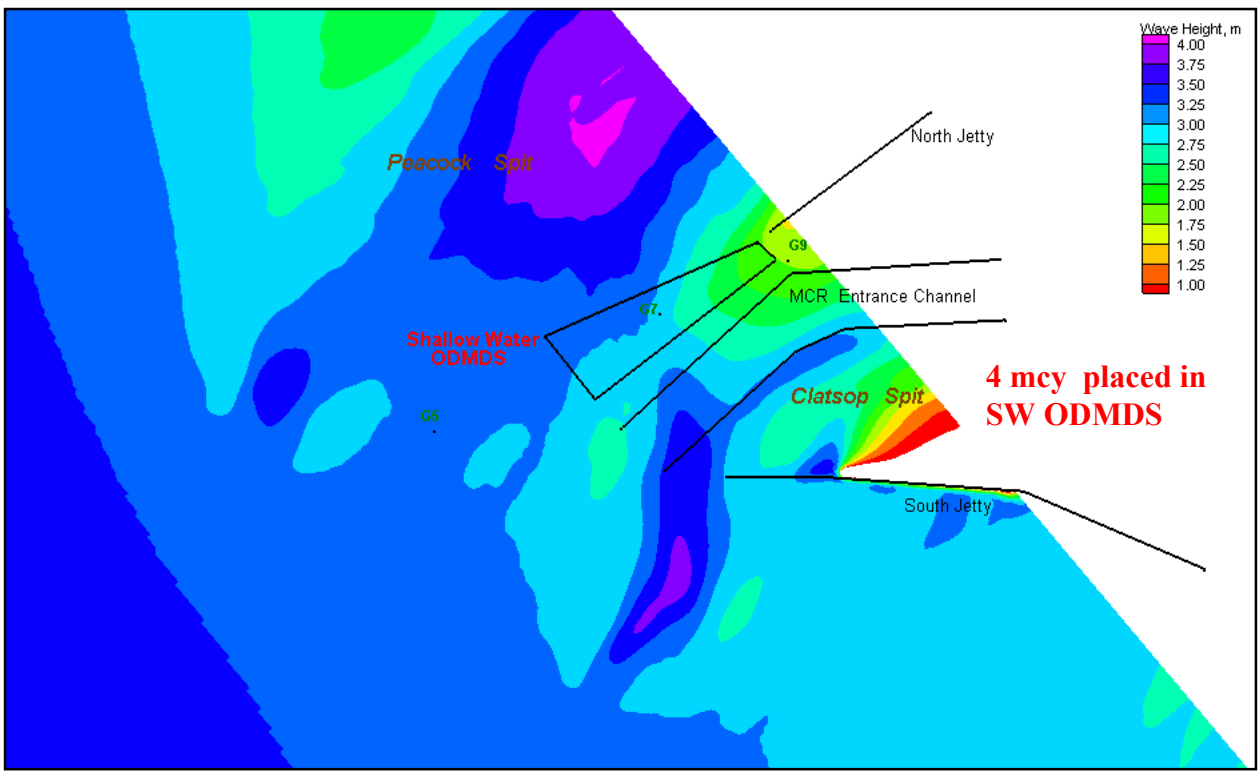


Figure M39 . Estimated wave amplification at MCR due to bathymetry change resulting from 4 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "4 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.





Offshore wave conditions (figure S5) for <u>Summer Storm</u>: Ht = 3.51 m, Tp=10.5 sec, Dir =175 deg, Wind=8.8 m/s @ 165 deg

Figure M40. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 4 MCY placed within SWS.

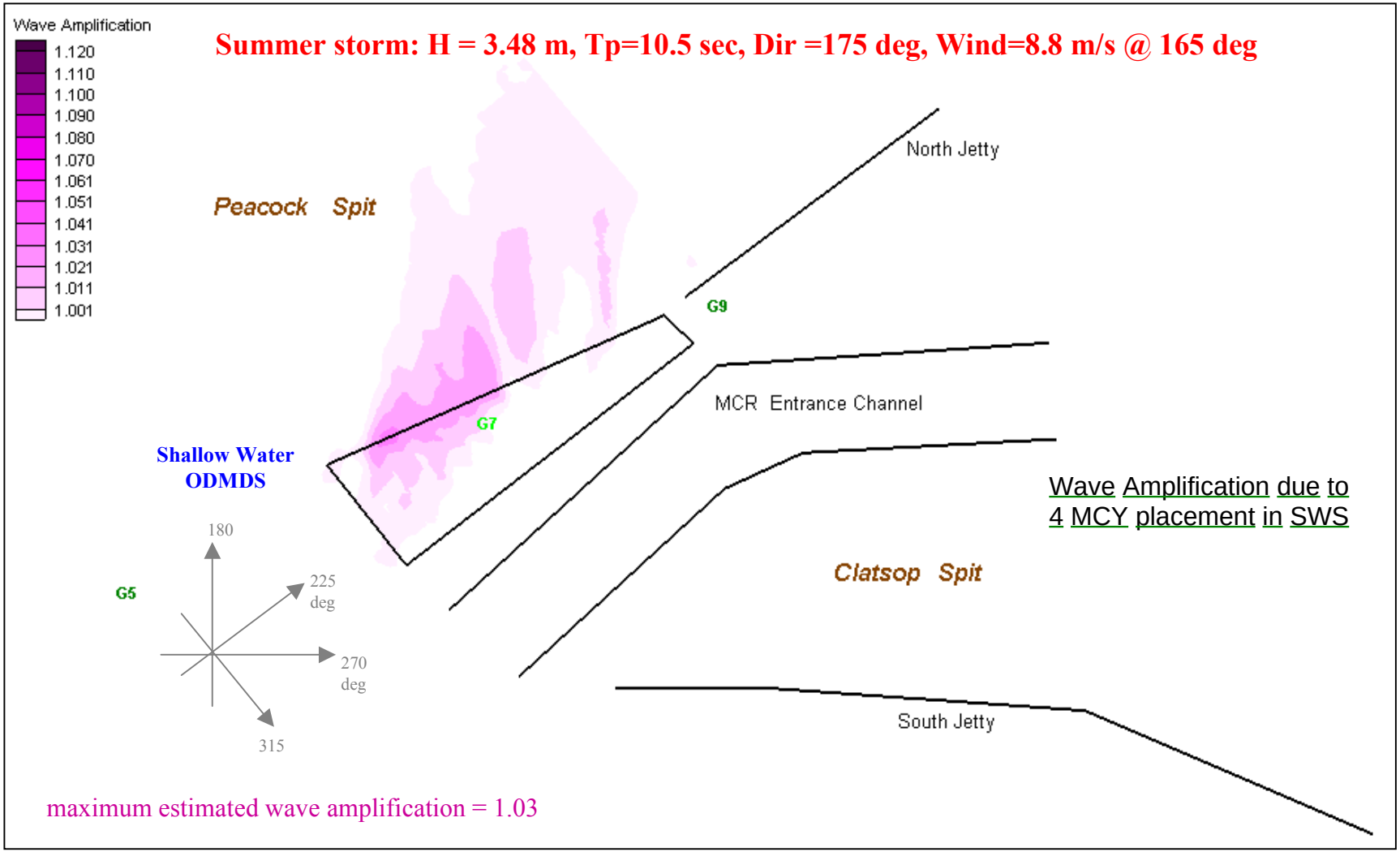


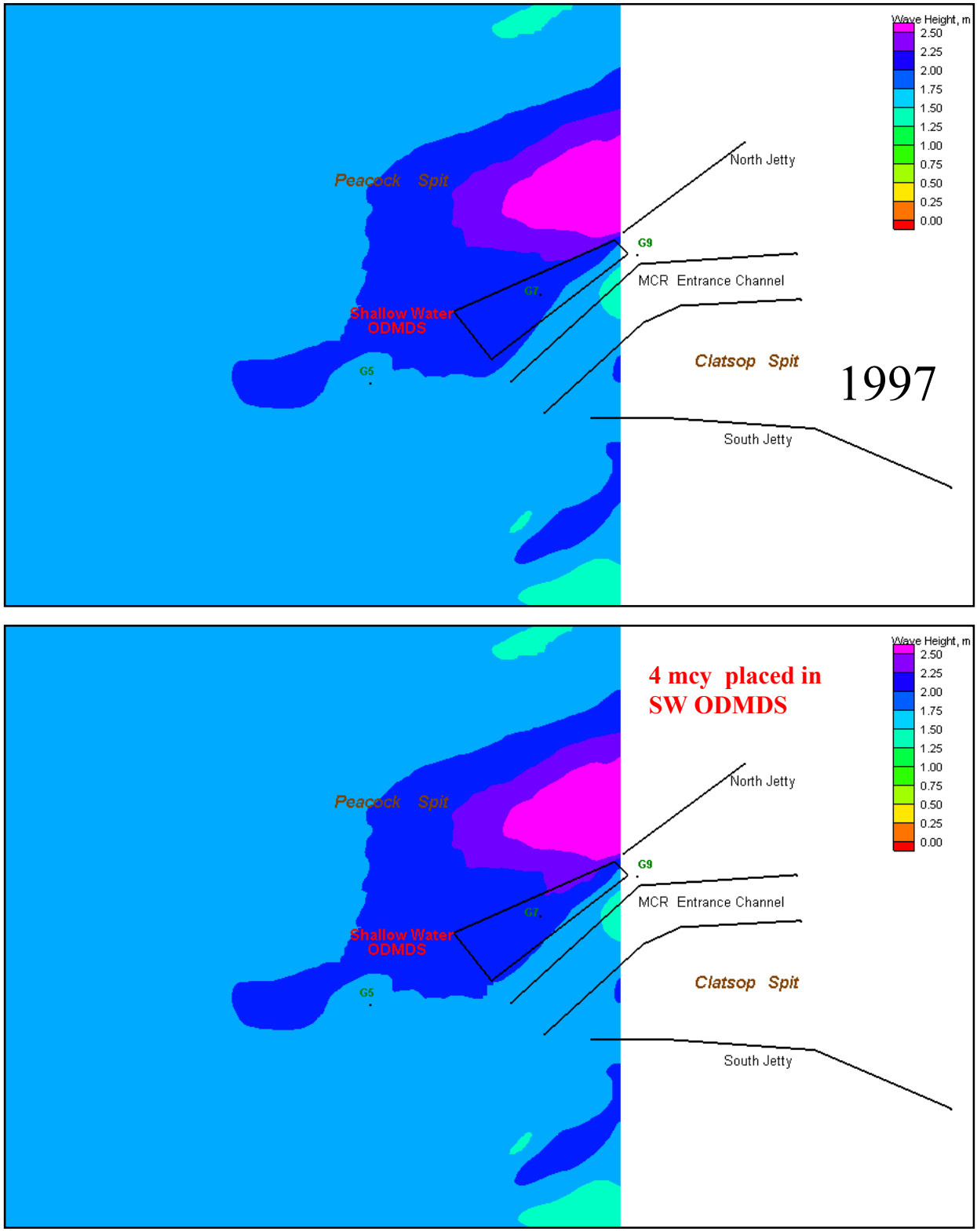
Figure M41 . Estimated wave amplification at MCR due to bathymetry change resulting from 4 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "4 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.

North-Northwest Wave Scenarios for Assessing **4 million cy placement** within Shallow Water ODMDS – Compared to 1997 Baseline Condition

Change in Wave Height

Changes in Wave Amplification

Changes in Wave Breaking



Offshore wave conditions (figure S6) for Summer Swell: Ht = 1.79 m, Tp=11.0 sec, Dir =275 deg, Wind=5.9 m/s @ 329 deg

Figure M42. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 4 MCY placed within SWS.

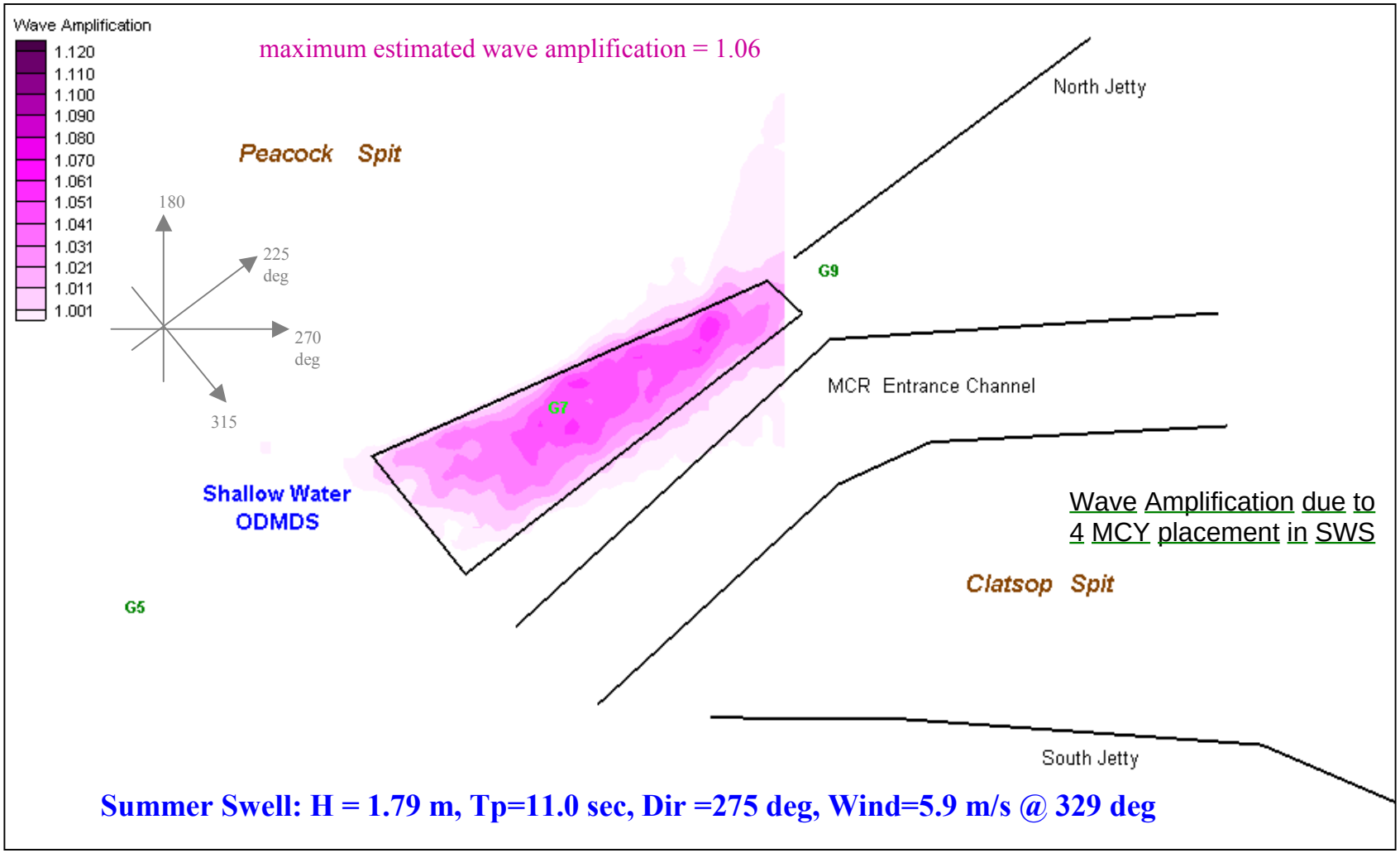
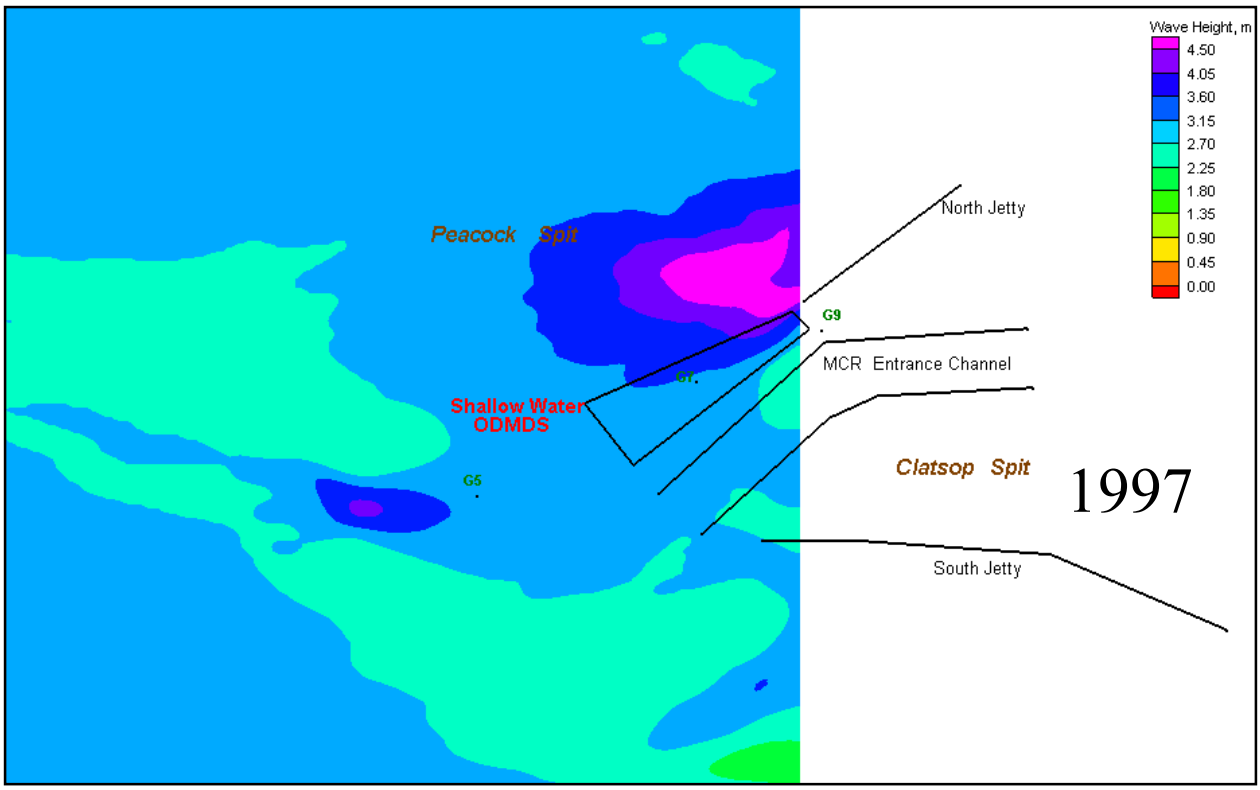
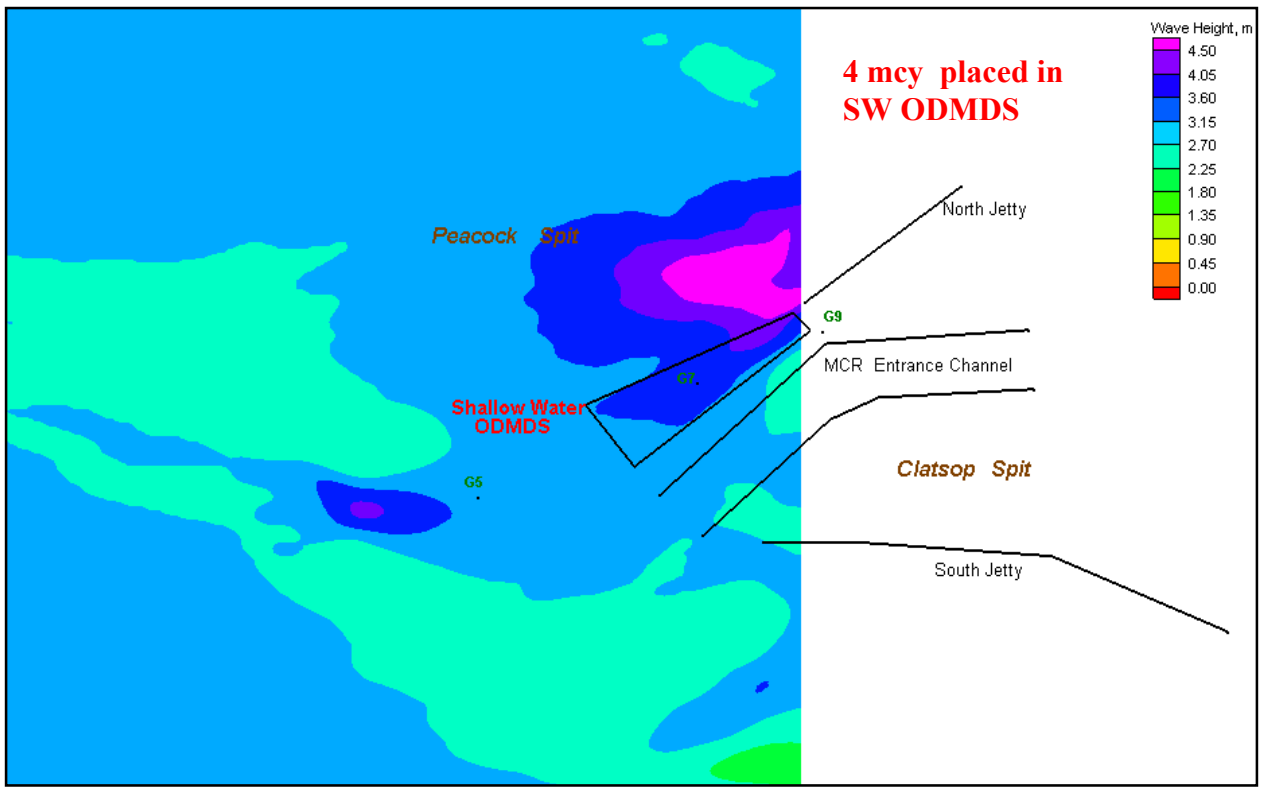


Figure M43 . Estimated wave amplification at MCR due to bathymetry change resulting from 4 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "4 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.





Offshore wave conditions (figure S7) for Winter Swell: Ht = 2.85 m, Tp=16.7 sec, Dir =280 deg, Wind=4.8 m/s @ 158 deg

Figure M44 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 4 MCY placed within SWS.

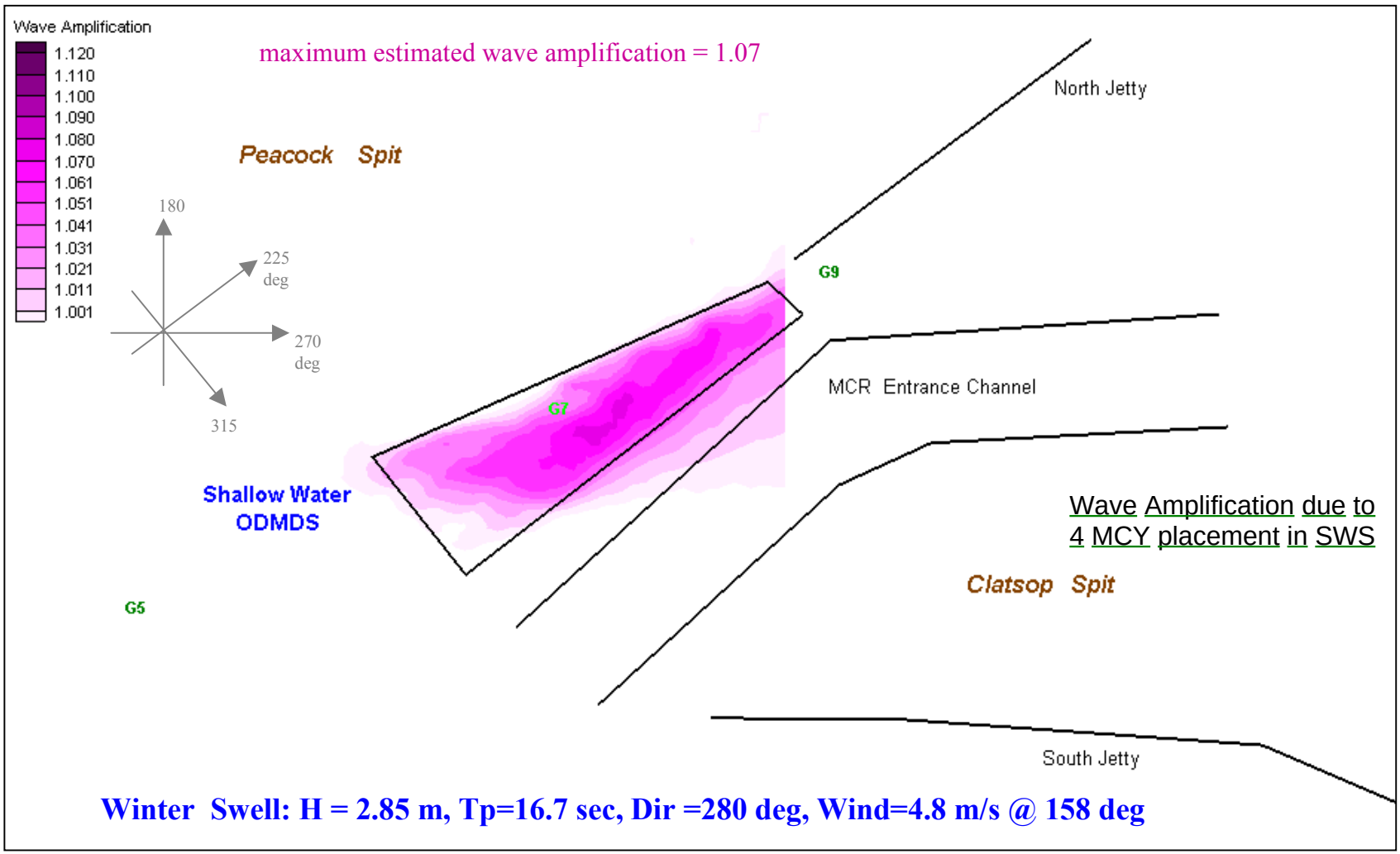
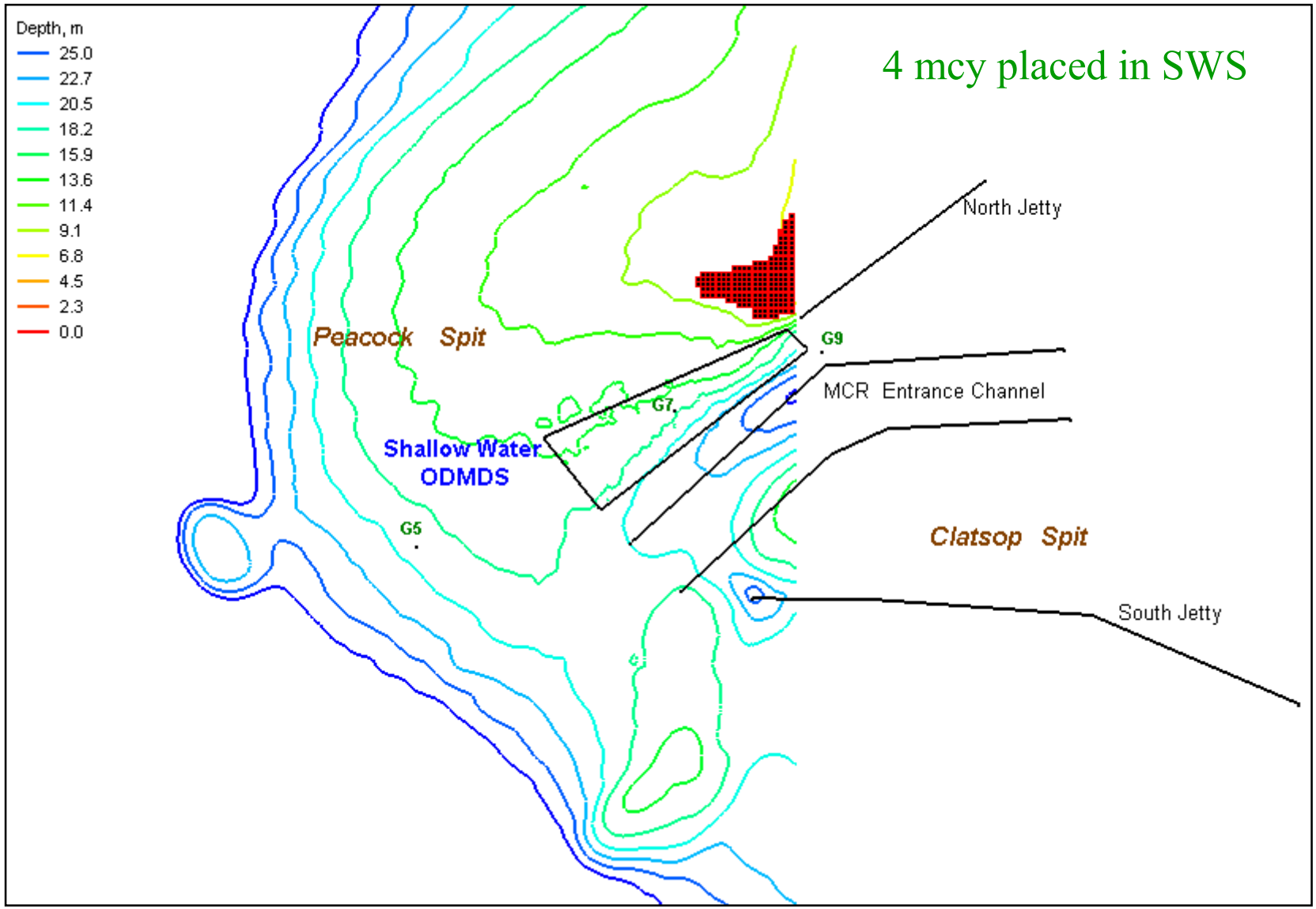
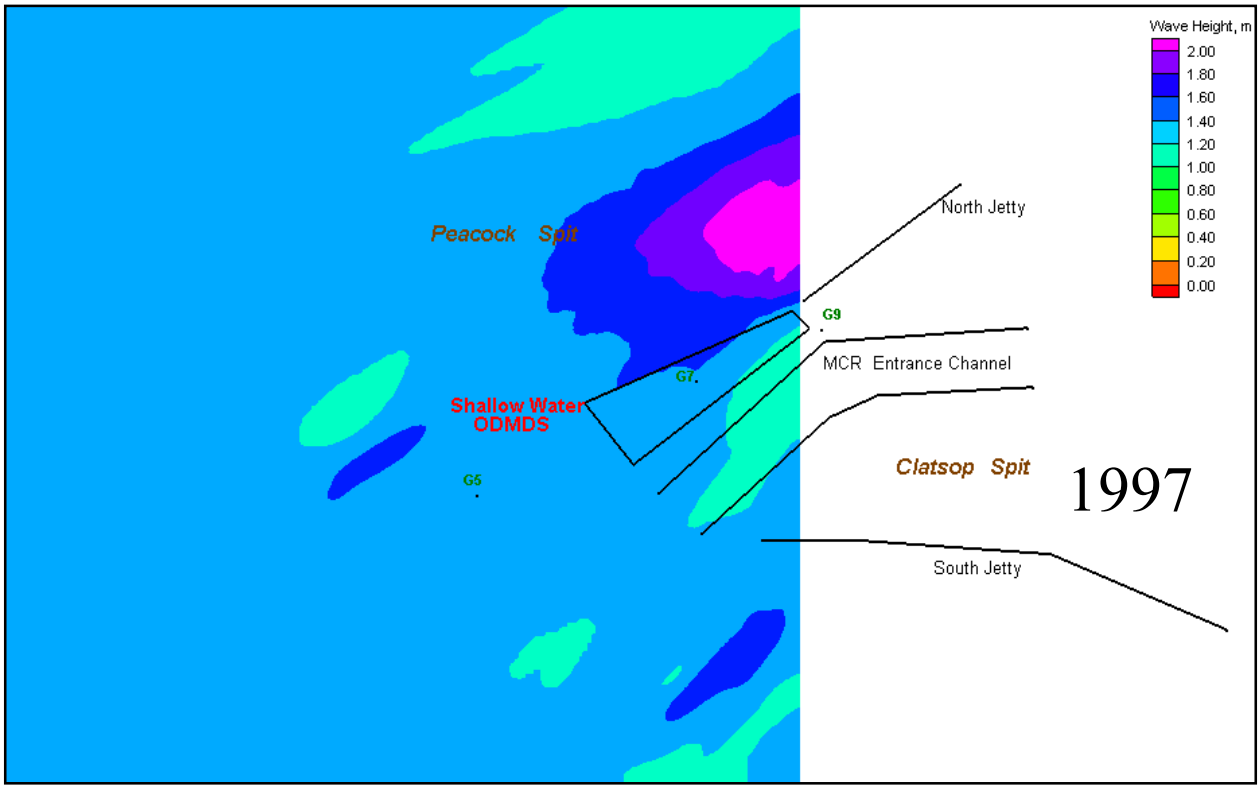


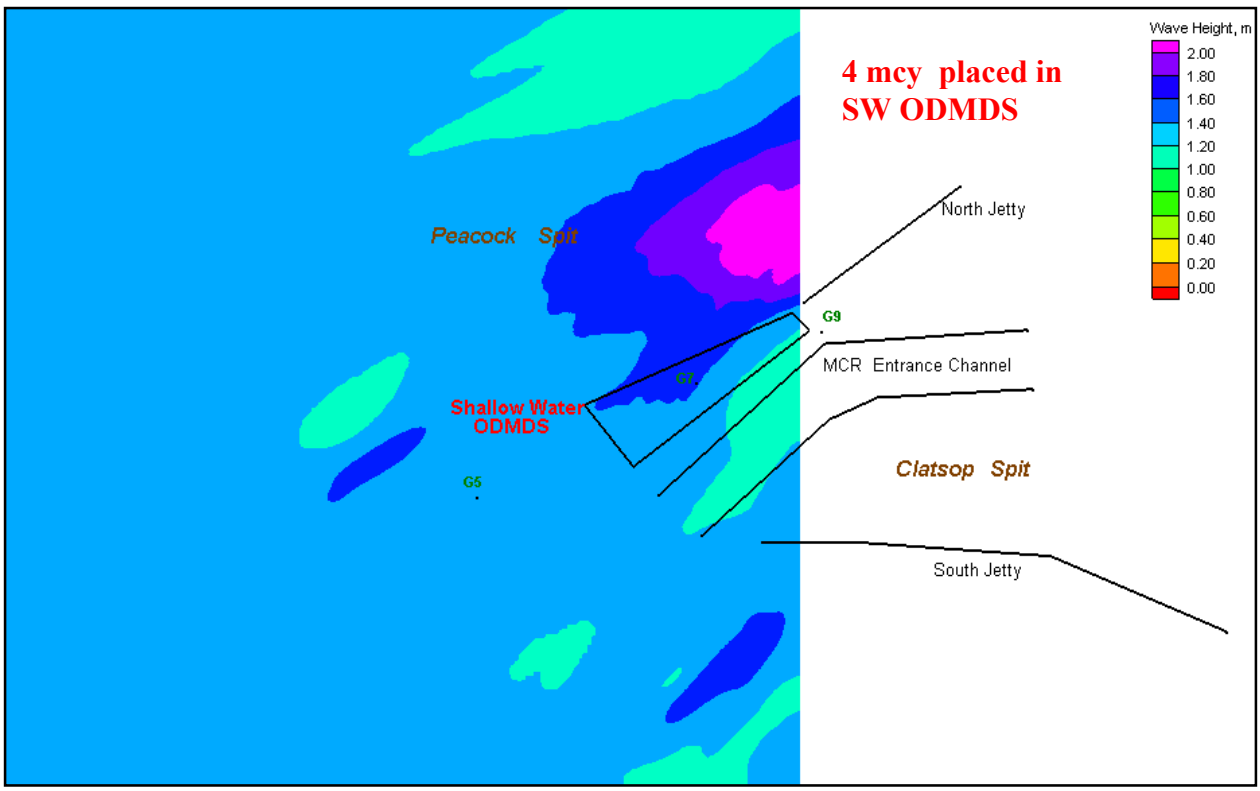
Figure M45 . Estimated wave amplification at MCR due to bathymetry change resulting from 4 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "4 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Swell: Avg. wave height = 2.85 m, peak wave period=16.7 sec, Avg. wave direction = W (280 deg), Wind=4.8 m/s @ SE (158 deg)

Figure M46. Estimated wave breaking location for 1997 (shown in black markers) and for 4 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+4 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.





Offshore wave conditions (figure S8) for Summer Swell: Ht = 1.29 m, Tp=16.7 sec, Dir =225 deg, Wind=5.4 m/s @ 316 deg

Figure M47. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 4 MCY placed within SWS.

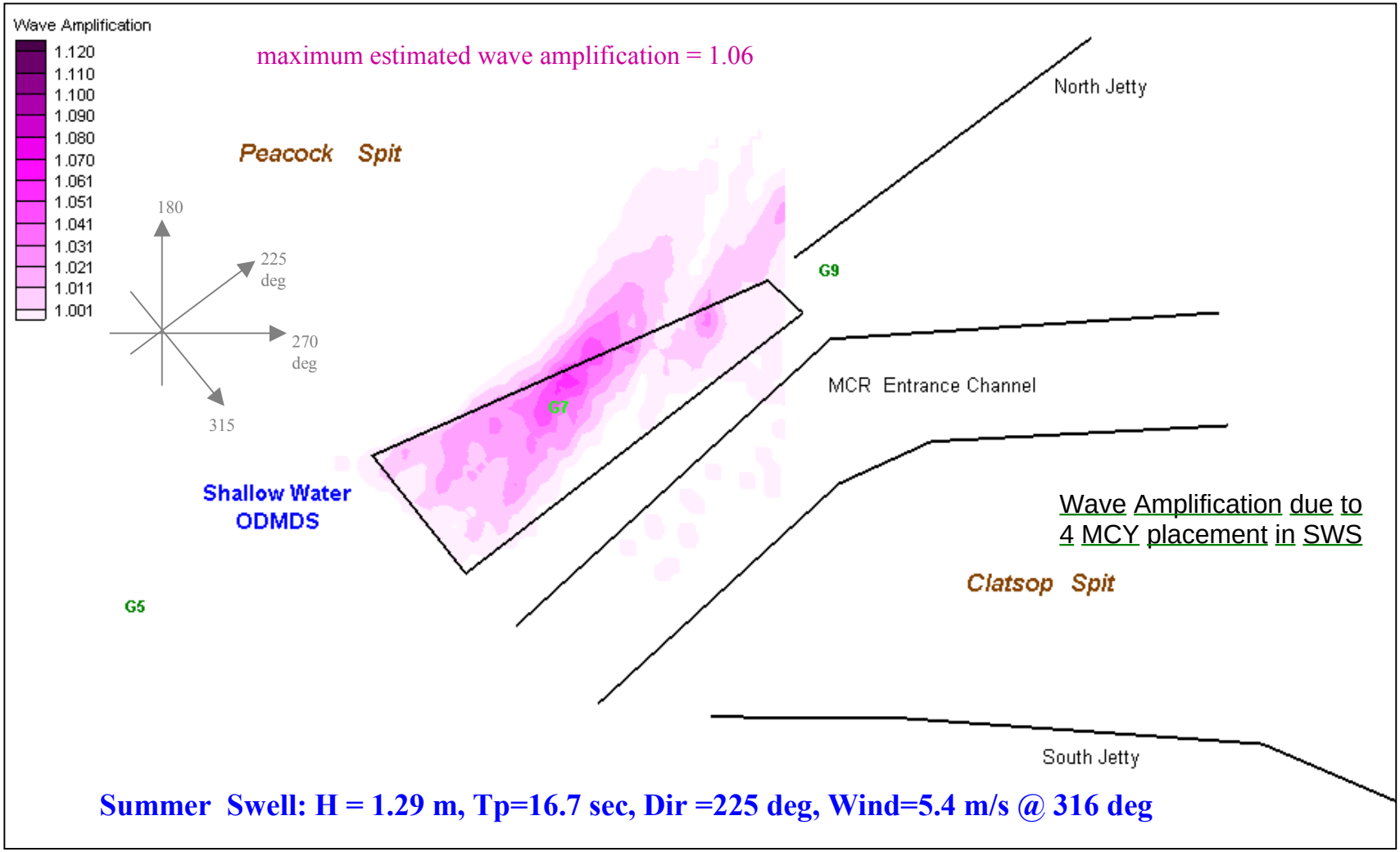
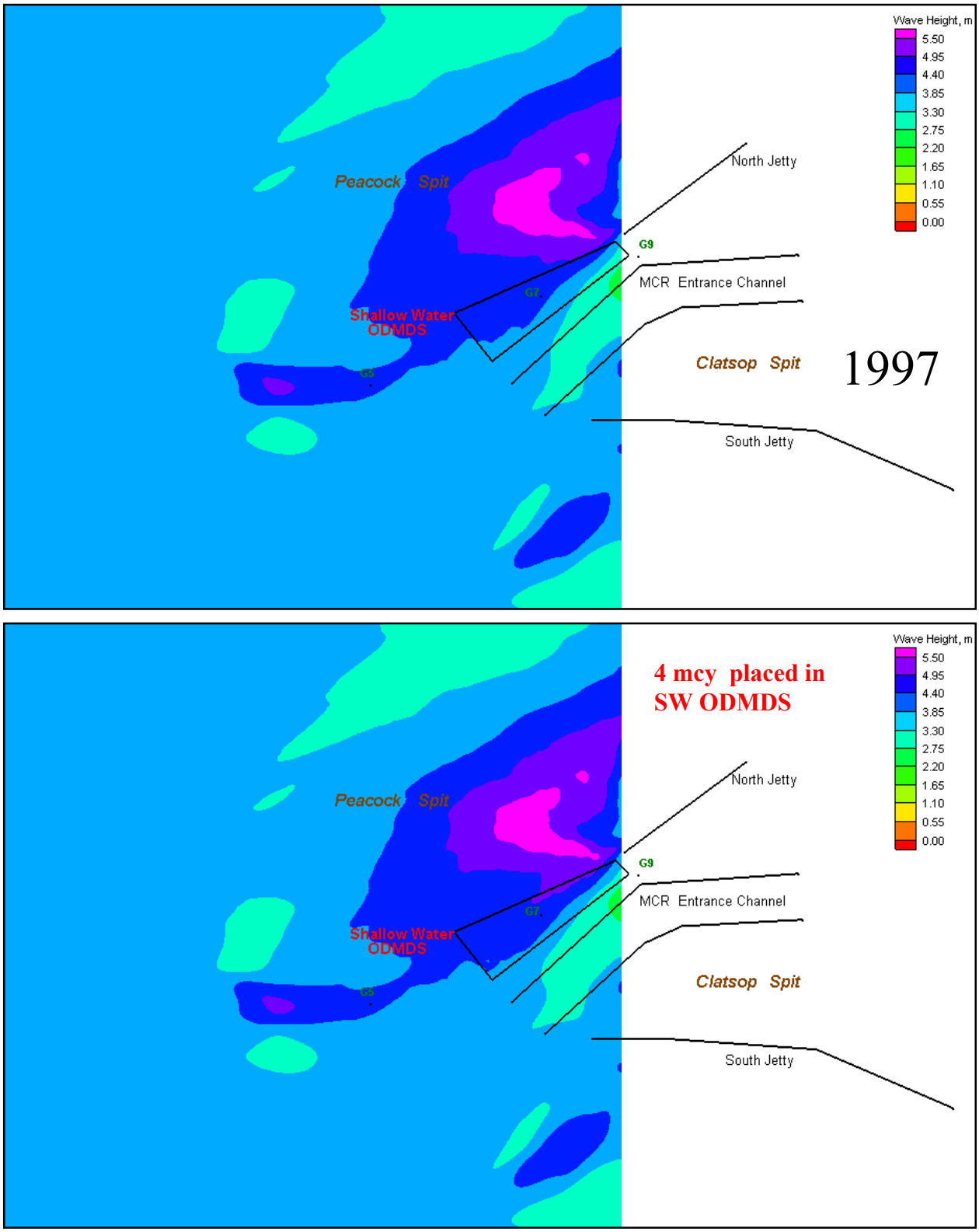


Figure M48 . Estimated wave amplification at MCR due to bathymetry change resulting from 4 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "4 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Offshore wave conditions (figure S9) for Winter Swell: Ht = 3.75 m, Tp=16.7 sec, Dir =275 deg, Wind=6.9 m/s @ 108 deg

Figure M49 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 4 MCY placed within SWS.

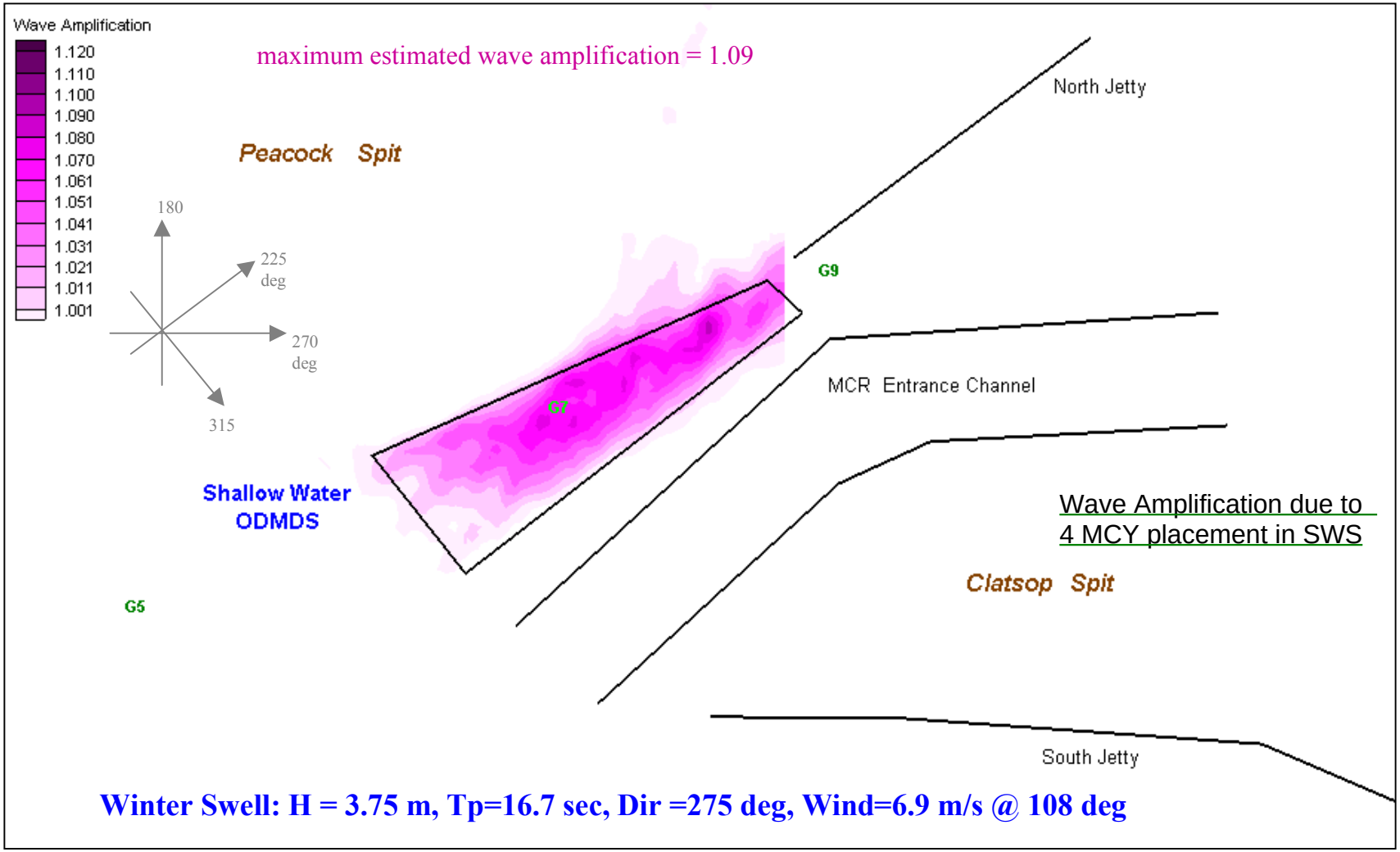
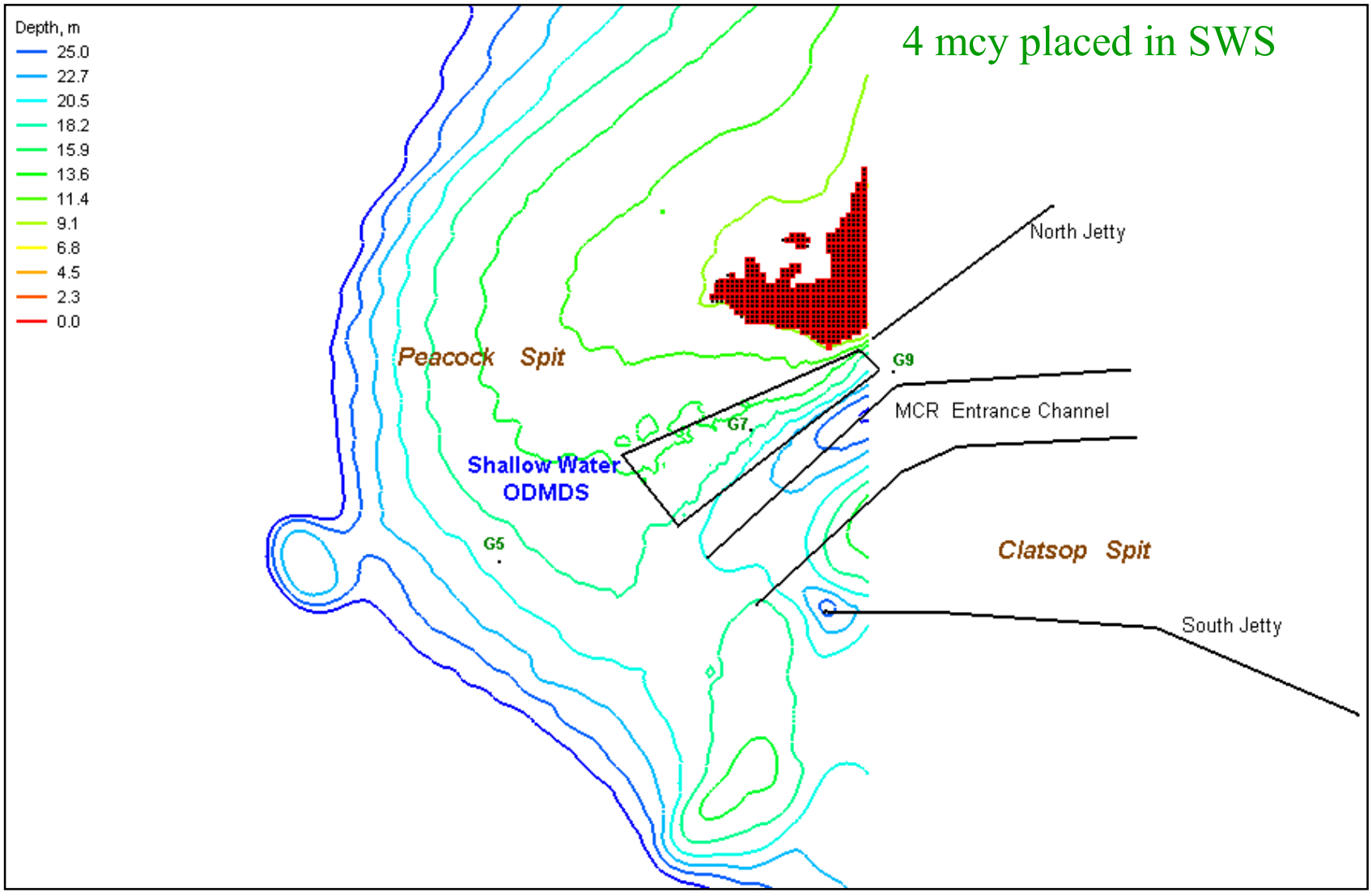
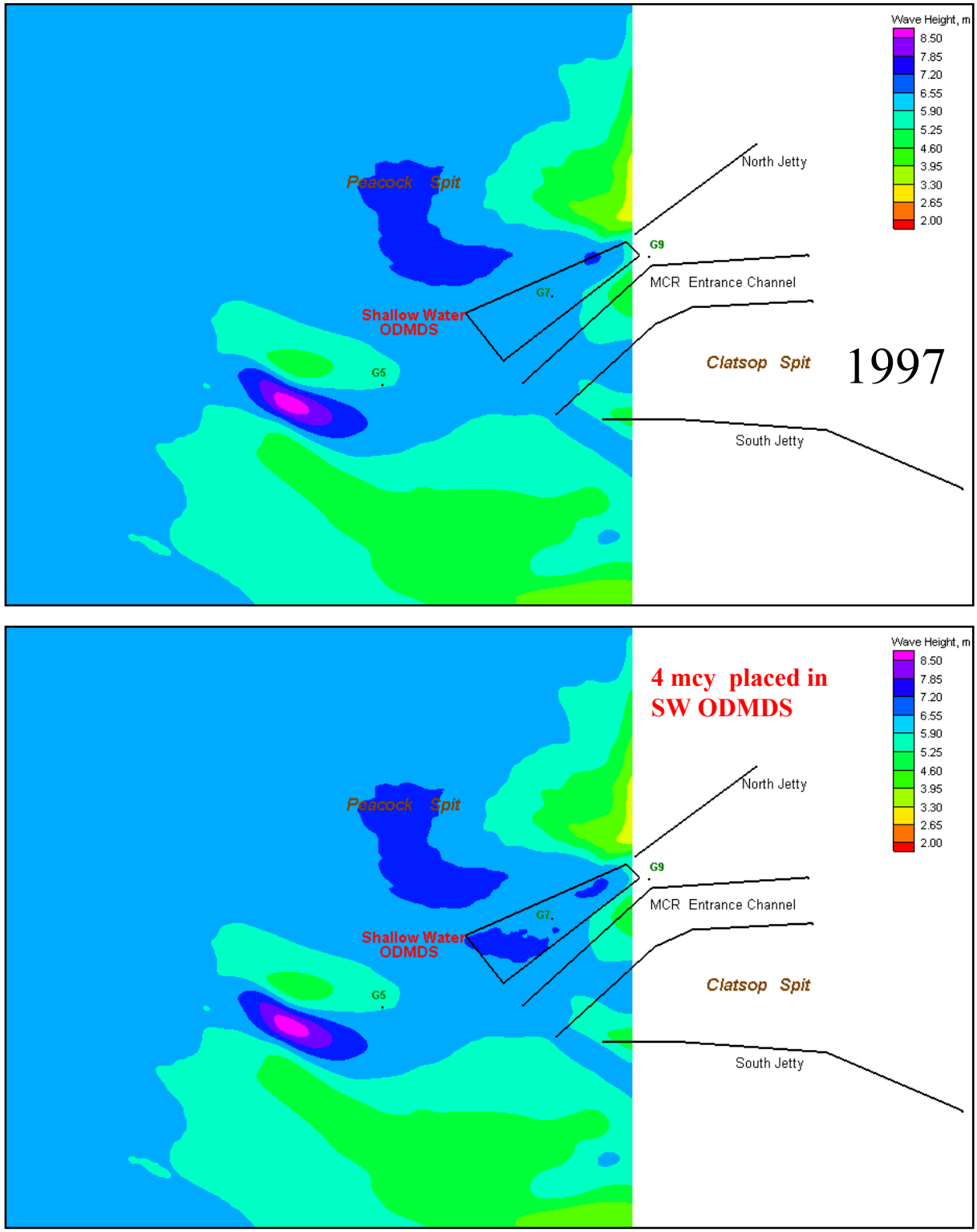


Figure M50 . Estimated wave amplification at MCR due to bathymetry change resulting from 4 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "4 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Swell: Avg. wave height= 3.75 m, peak wave period =16.7 sec, Avg. wave direction =W (275 deg), Wind=6.9 m/s @ E (108 deg)

Figure M51. Estimated wave breaking location for 1997 (shown in black markers) and for 4 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+4 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.



Offshore wave conditions (figure S10) for Winter Storm: Ht = 6.55 m, Tp=14.0 sec, Dir =310 deg, Wind=10.4 m/s @ 294 deg

Figure M52. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 4 MCY placed within SWS.

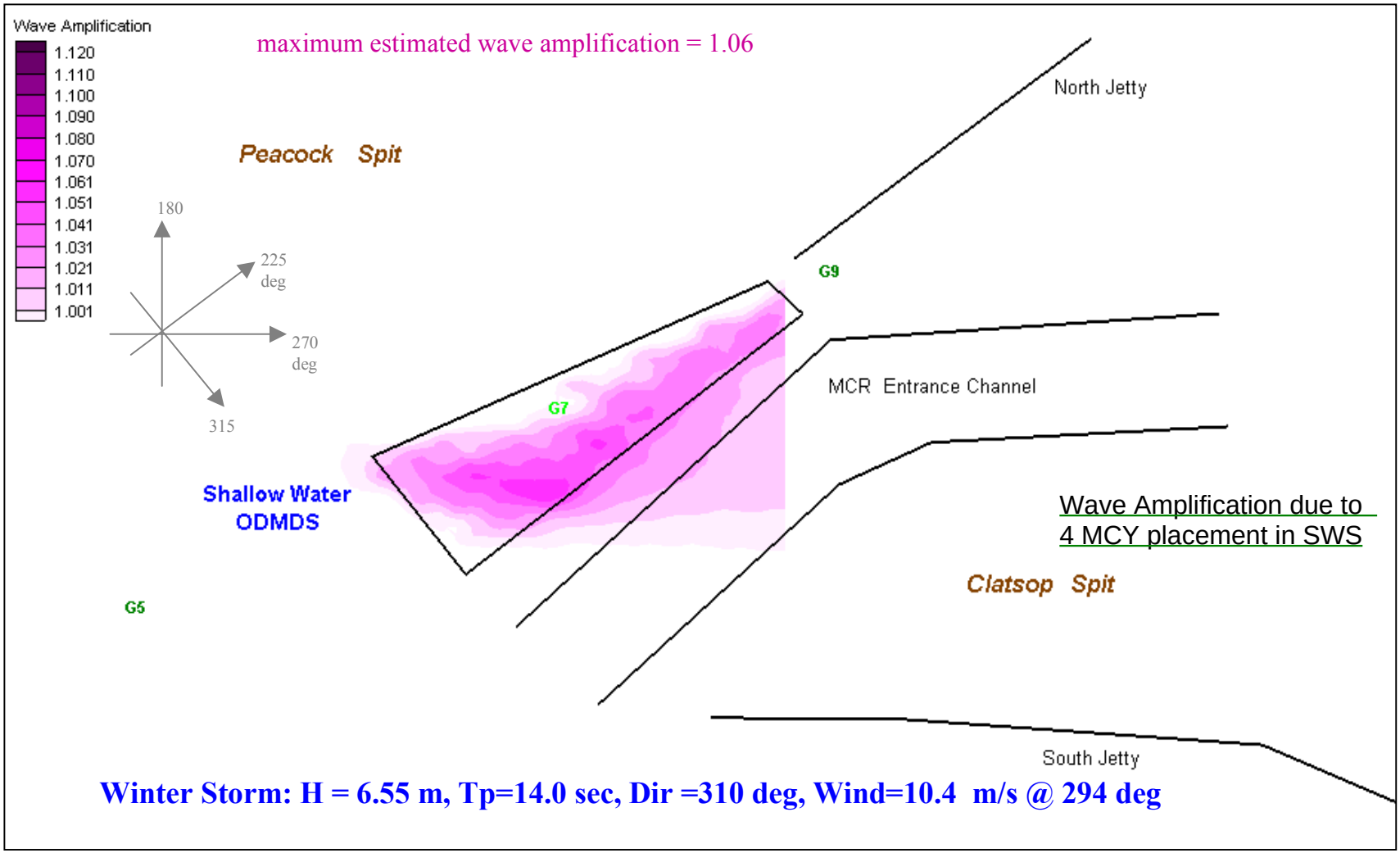
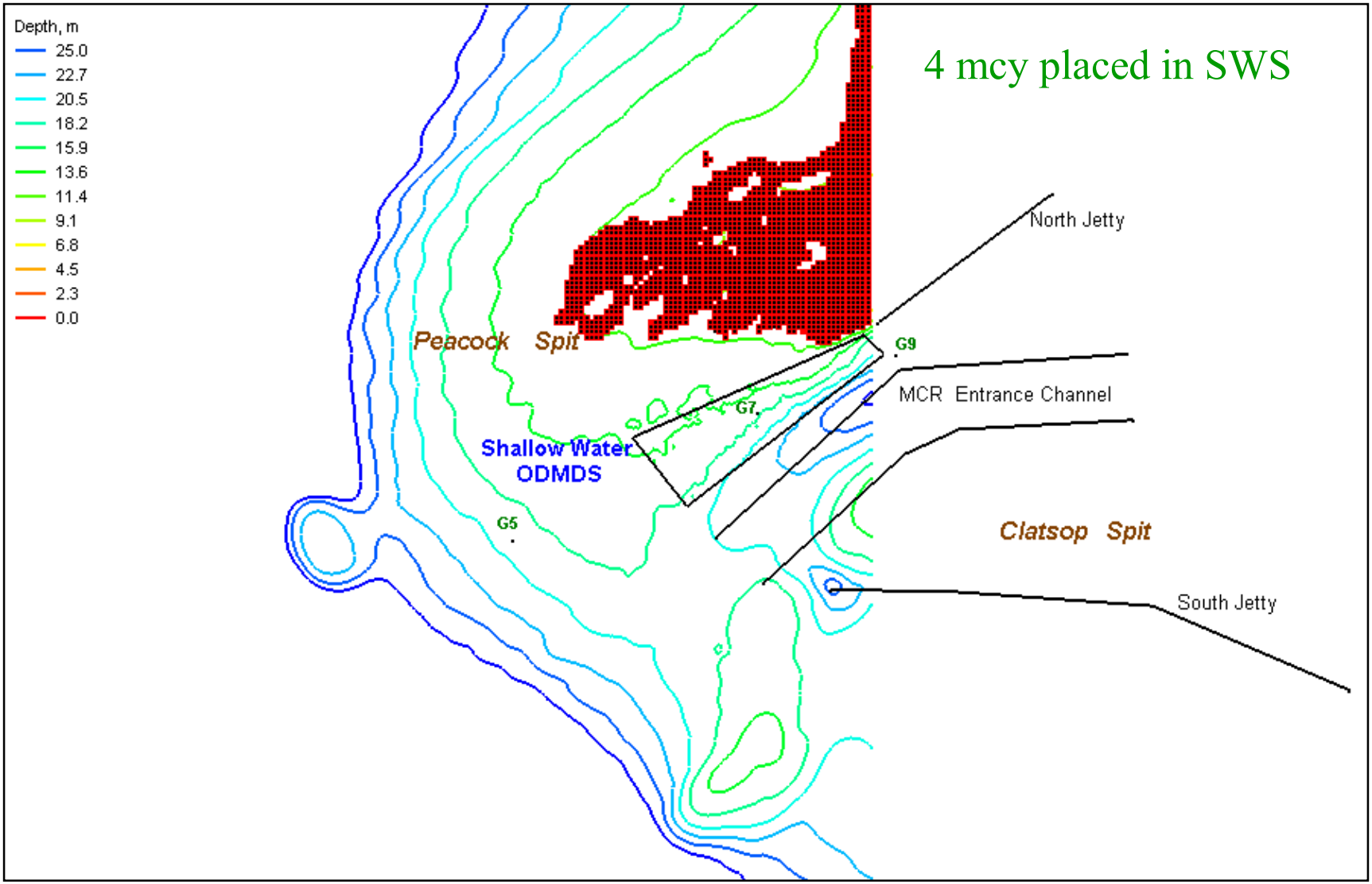
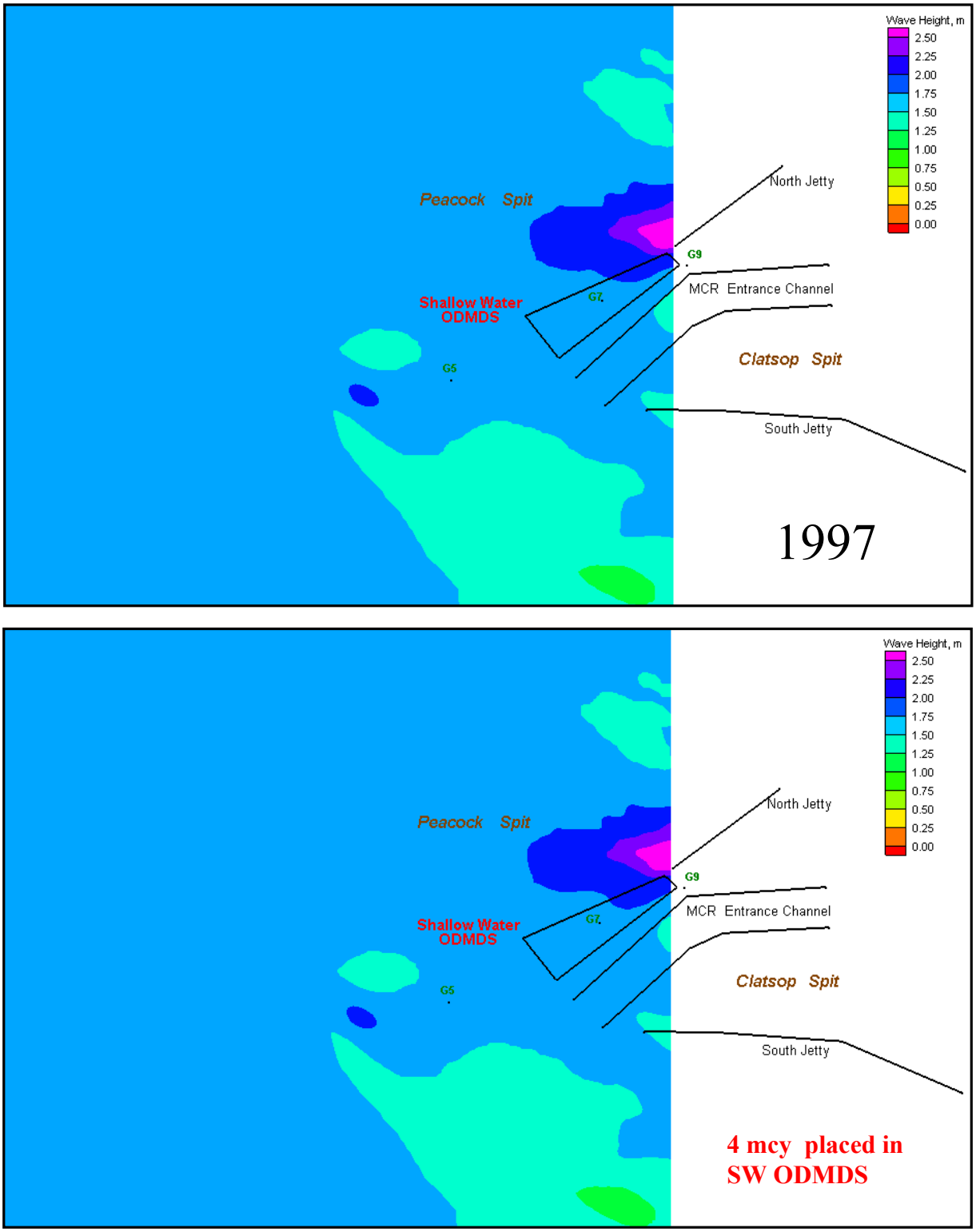


Figure M53 . Estimated wave amplification at MCR due to bathymetry change resulting from 4 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "4 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Storm: Avg. wave height = 6.55 m, peak wave period =14.0 sec, Avg. wave direction = NW (310 deg), Wind=10.4 m/s @ NW (294 deg)

Figure M54. Estimated wave breaking location for 1997 (shown in black markers) and for 4 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+4 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.



Offshore wave conditions (figure S11) for Summer Swell: Ht = 1.77 m, Tp=8.3 sec, Dir =305 deg, Wind=2.1 m/s @ 334 deg

Figure M55. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 4 MCY placed within SWS.

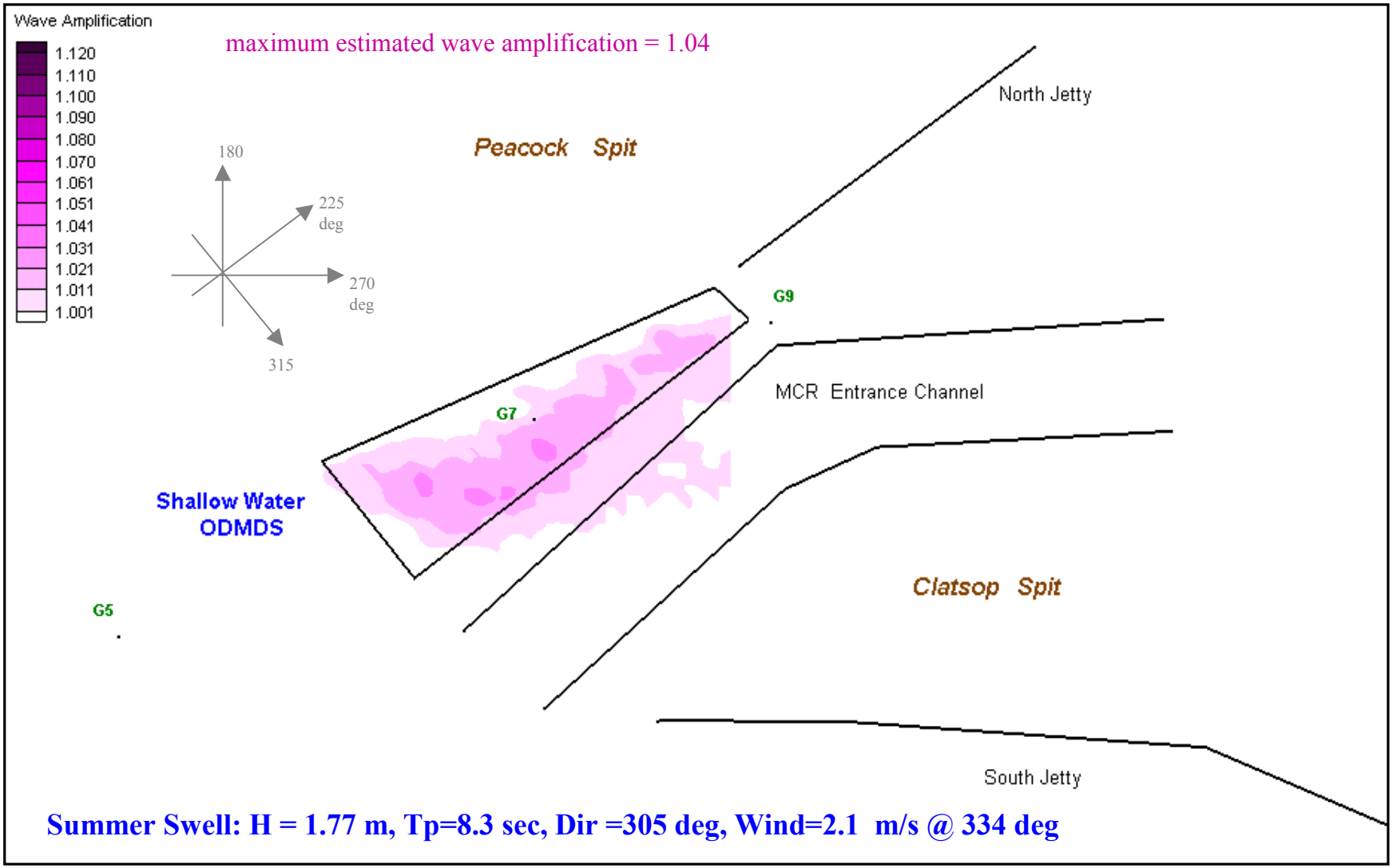


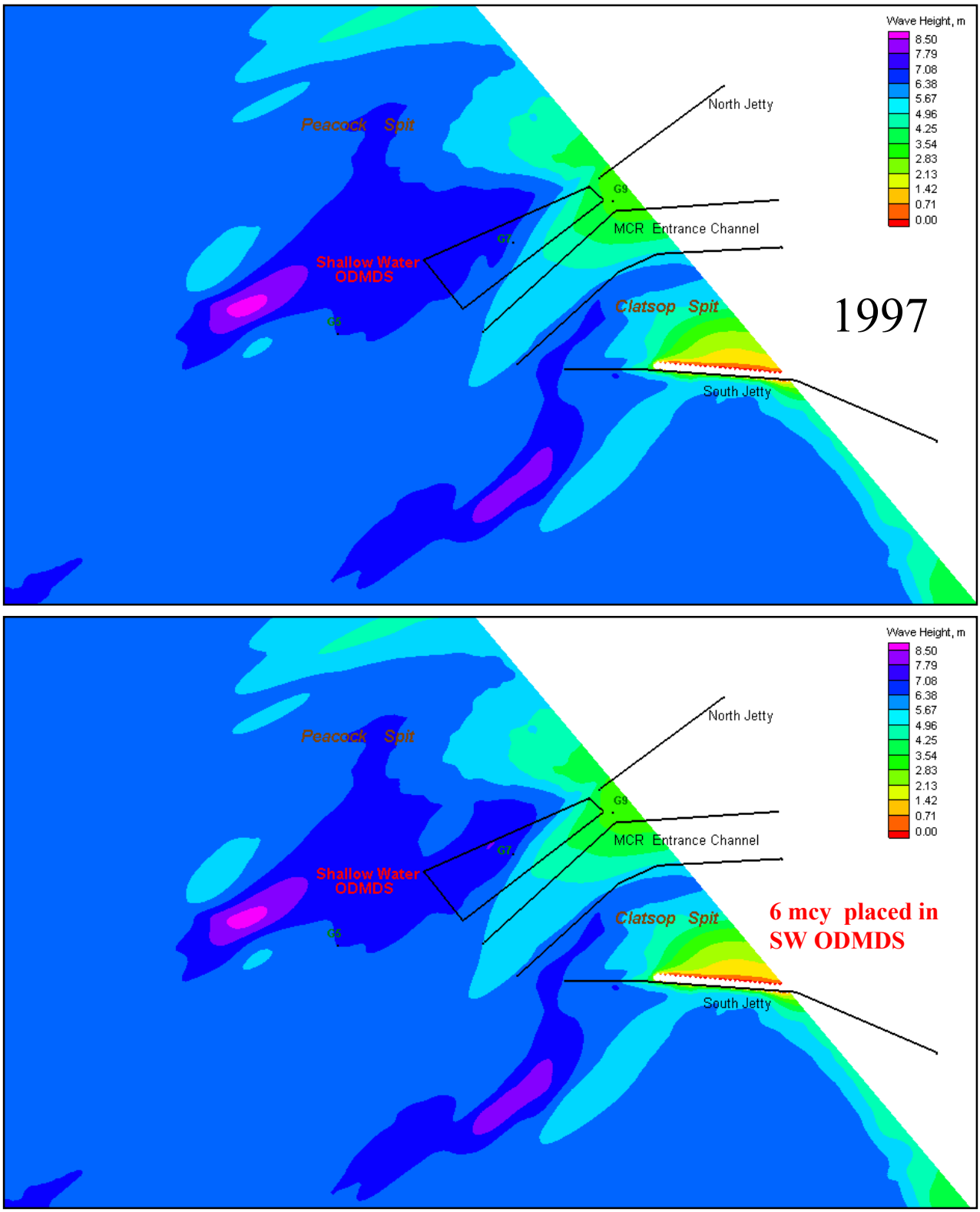
Figure M56 . Estimated wave amplification at MCR due to bathymetry change resulting from 4 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "4 million cy placement wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves for the 4 million cy placement scenario were estimated to be 20% greater than in 1997.

South-Southwest Wave Scenarios for Assessing **6 million cy placement** within Shallow Water ODMDS – Compared to 1997 Baseline Condition

Change in Wave Height

Changes in Wave Amplification

Changes in Wave Breaking



Offshore wave conditions (figure S1) for <u>Winter Storm</u>: Ht= 6.48 m, Tp=12.5 sec, Dir =225 deg, Wind=13.8 m/s @ 180 deg

Figure M57. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 6 MCY placed within SWS.

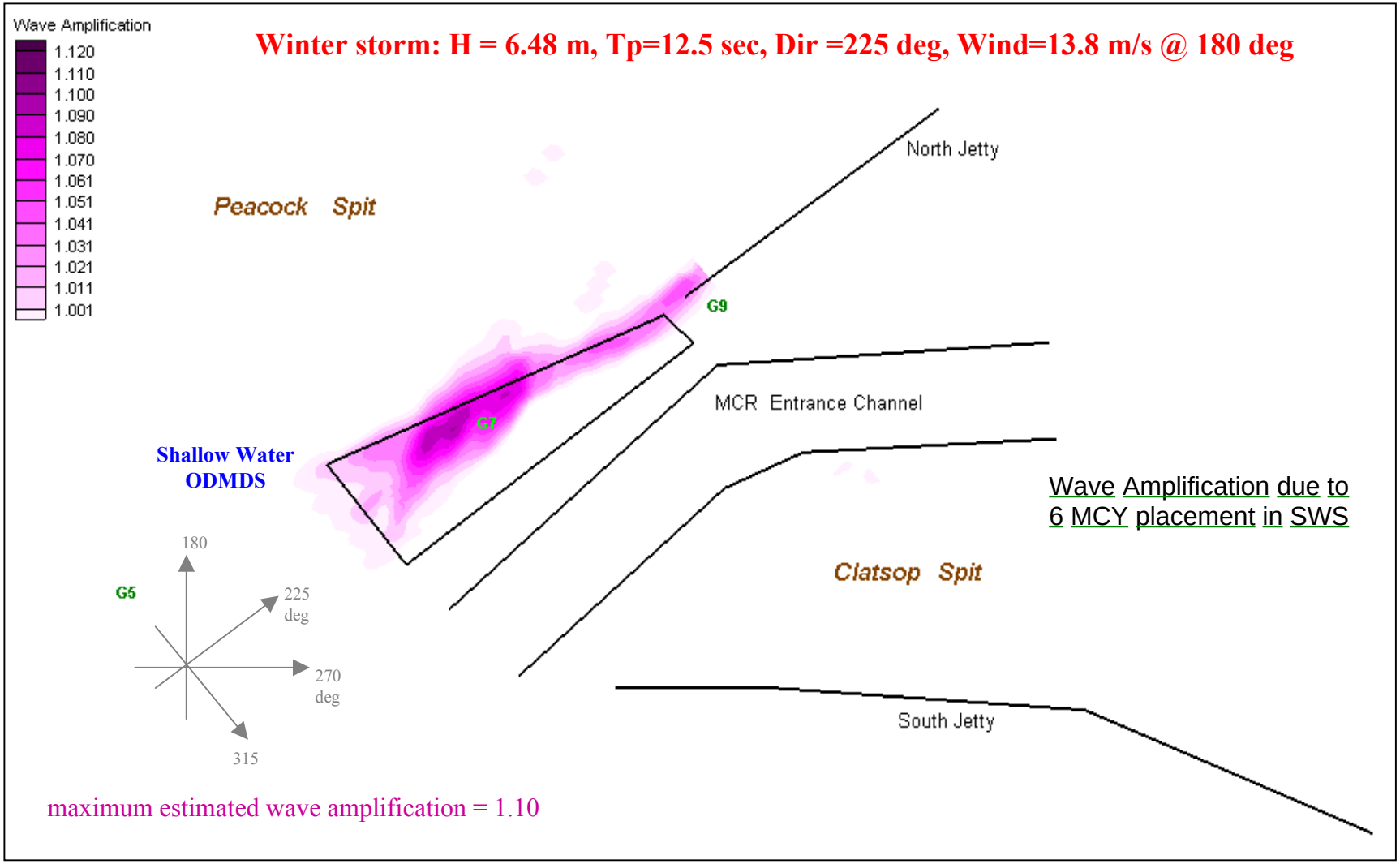
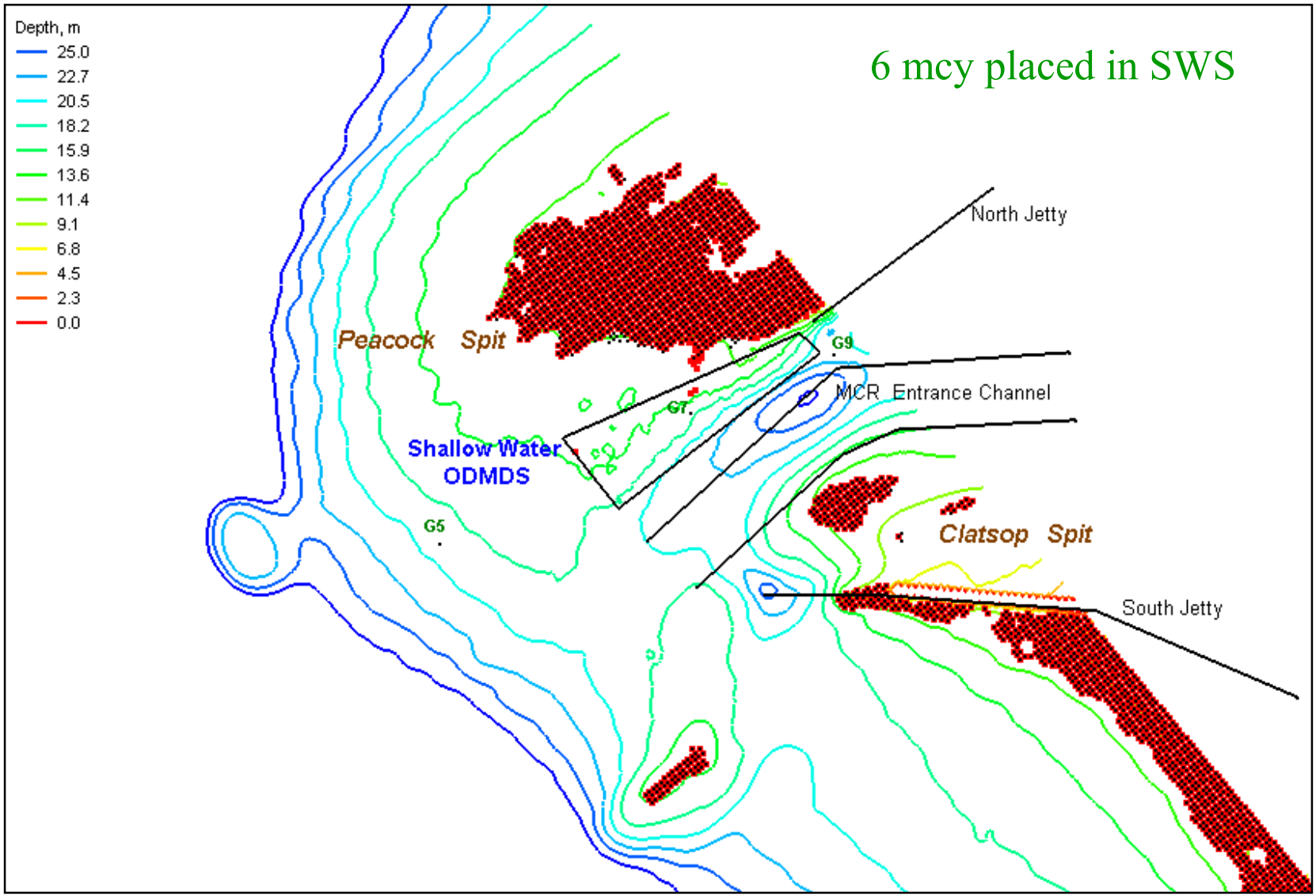
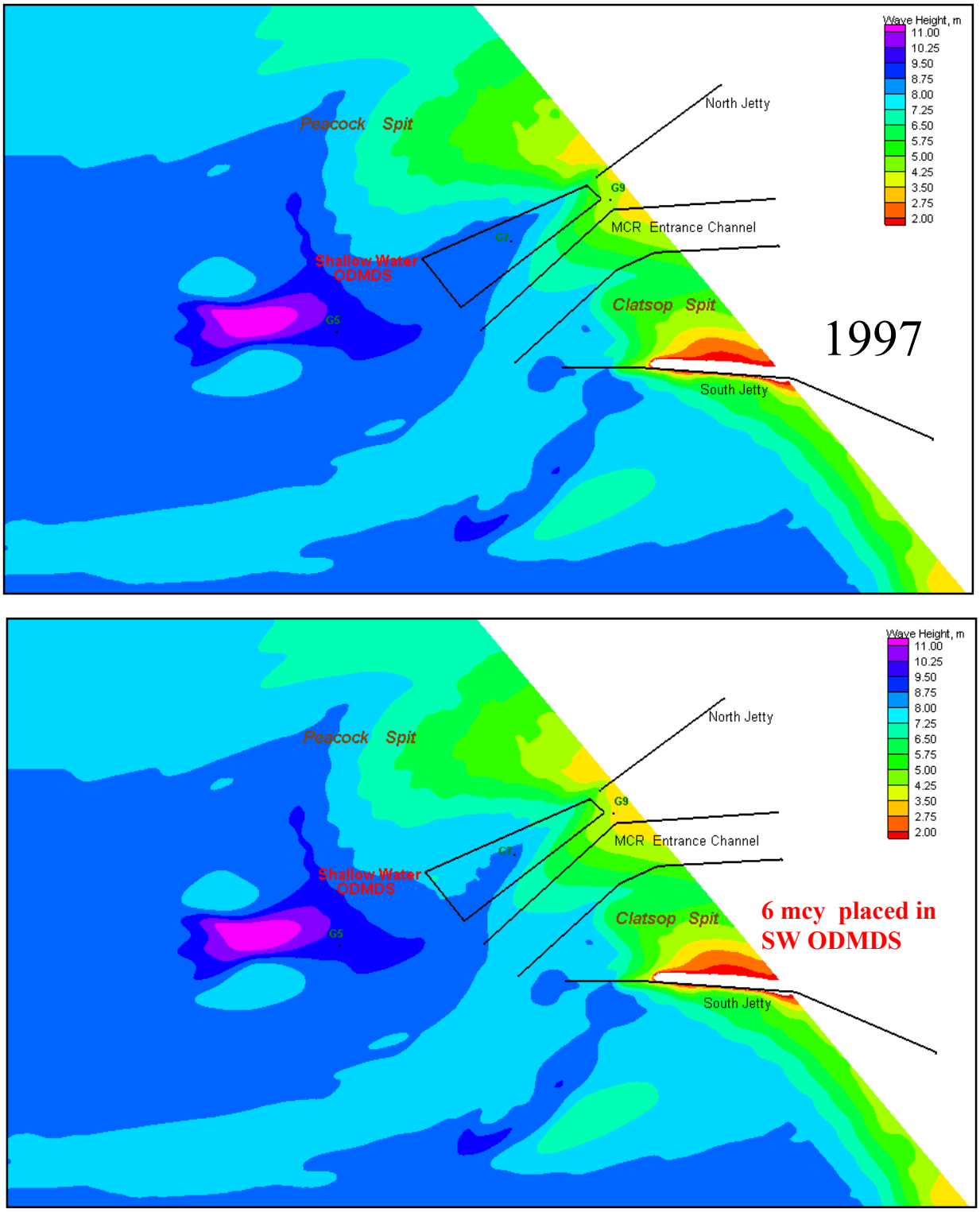


Figure M58 . Estimated wave amplification at MCR due to bathymetry change resulting from 6 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "6 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Storm: Avg. wave height = 6.48 m, Peak wave period =12.5 sec, Avg. wave direction = SW (225 deg), Wind=13.8 m/s @ S (180 deg)

Figure M59. Estimated wave breaking location for 1997 (shown in black markers) and for 6 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+6 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.



Offshore wave conditions (figure S2) for Winter Storm: Ht = 8.34 m, Tp=16.7 sec, Dir =260 deg, Wind=14.2 m/s @ 192 deg

Figure M60. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 6 MCY placed within SWS.

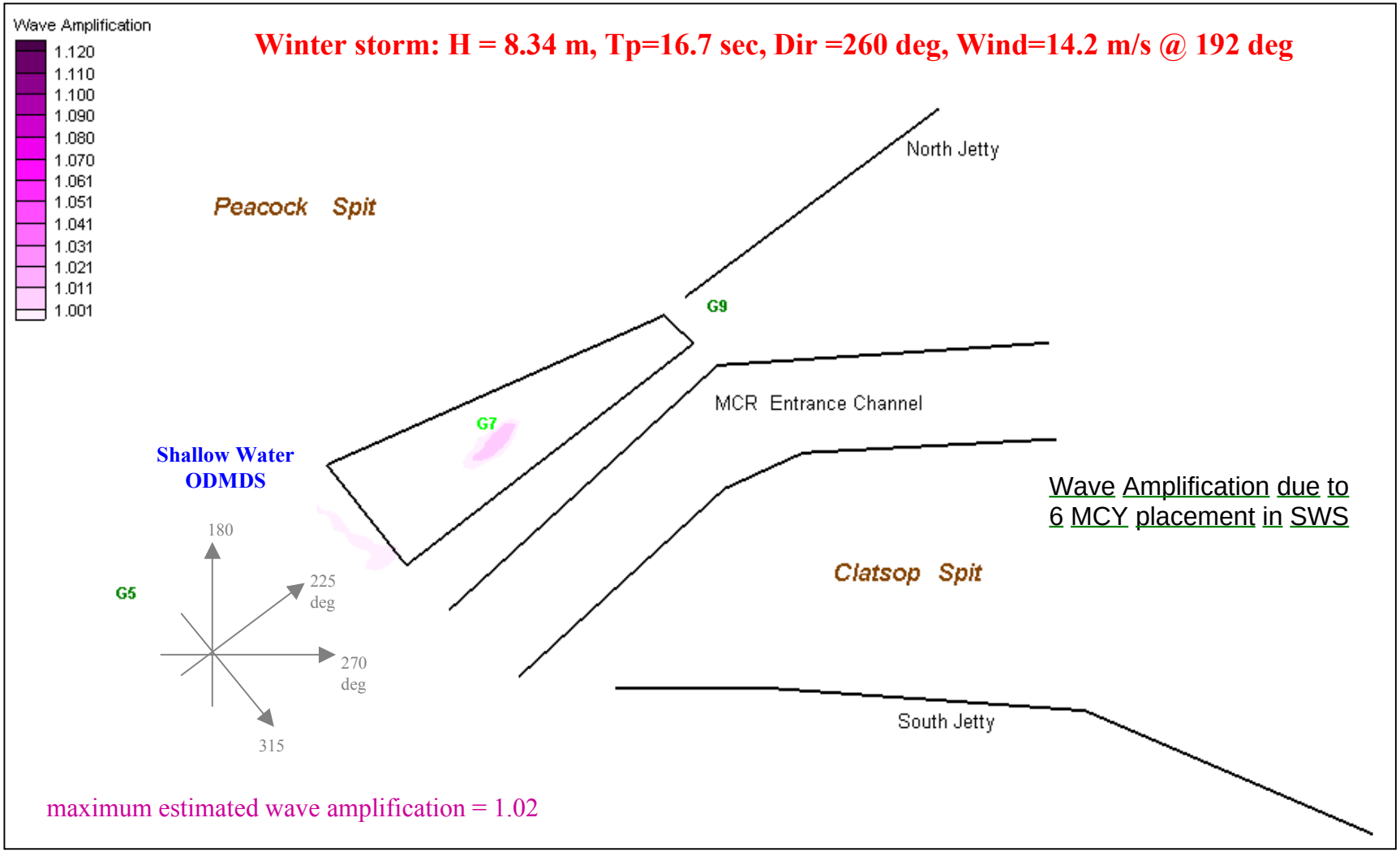
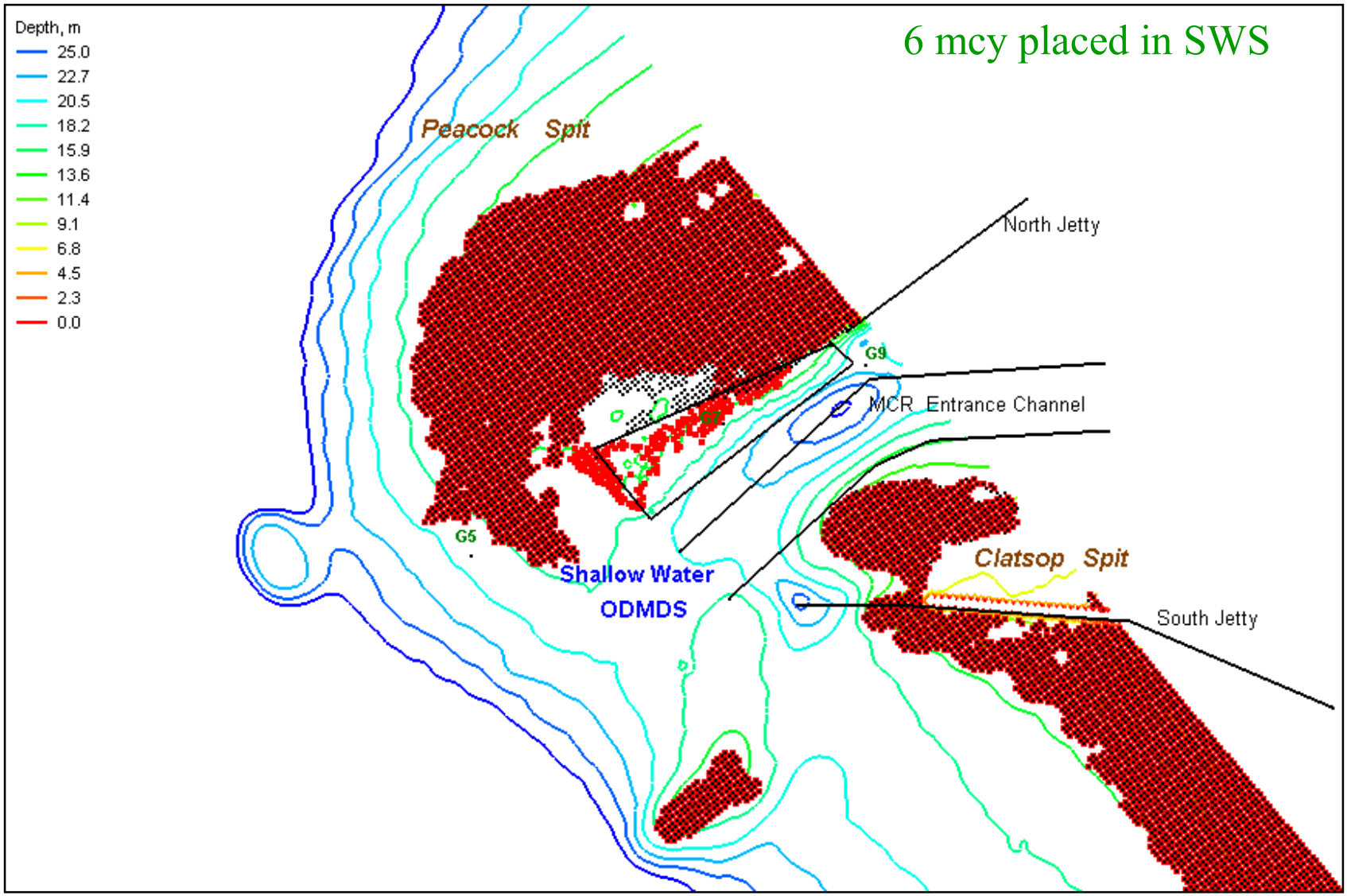
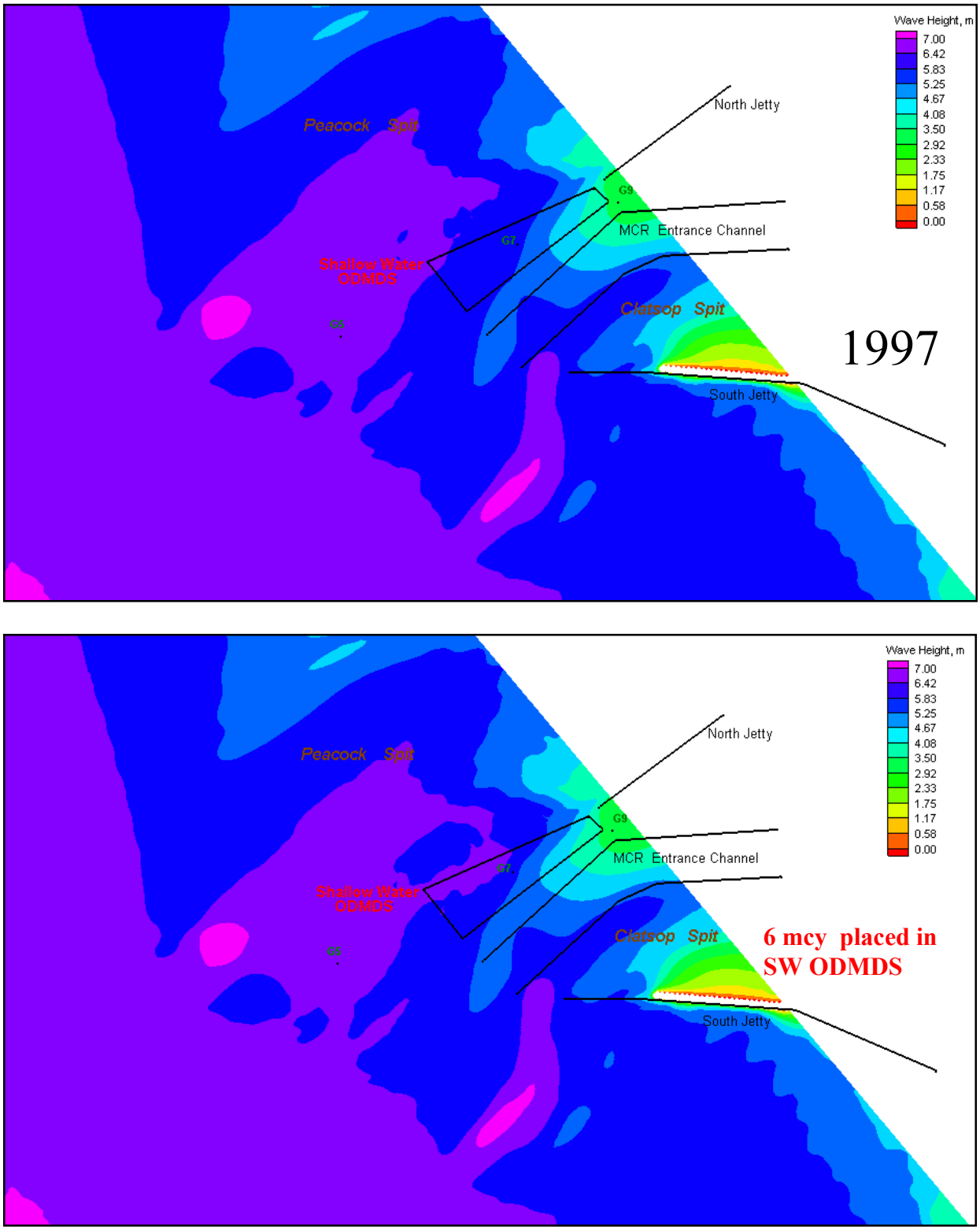


Figure M61 . Estimated wave amplification at MCR due to bathymetry change resulting from 6 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "6 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Storm: Avg. wave height = 8.34 m, Peak wave period=16.7 sec, Avg. wave direction =W (260 deg), Wind=14.2 m/s @ S (192 deg)

Figure M62. Estimated wave breaking location for 1997 (shown in black markers) and for 6 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+6 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.



Offshore wave conditions (figure S3) for <u>Winter Storm</u>: Ht = 6.78 m, Tp=10.5 sec, Dir =210 deg, Wind=14.8 m/s @ 190 deg

Figure M63. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 6 MCY placed within SWS.

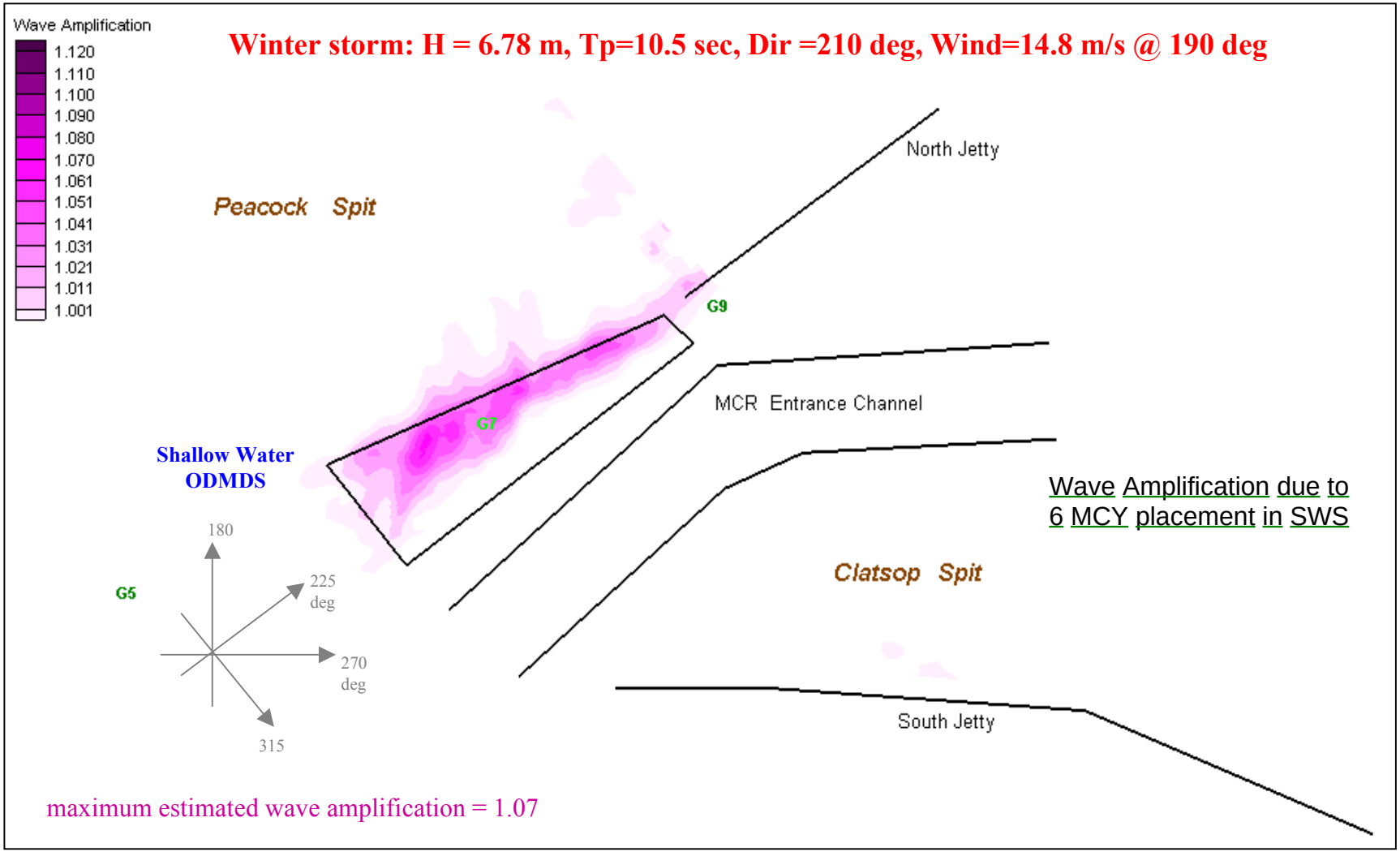
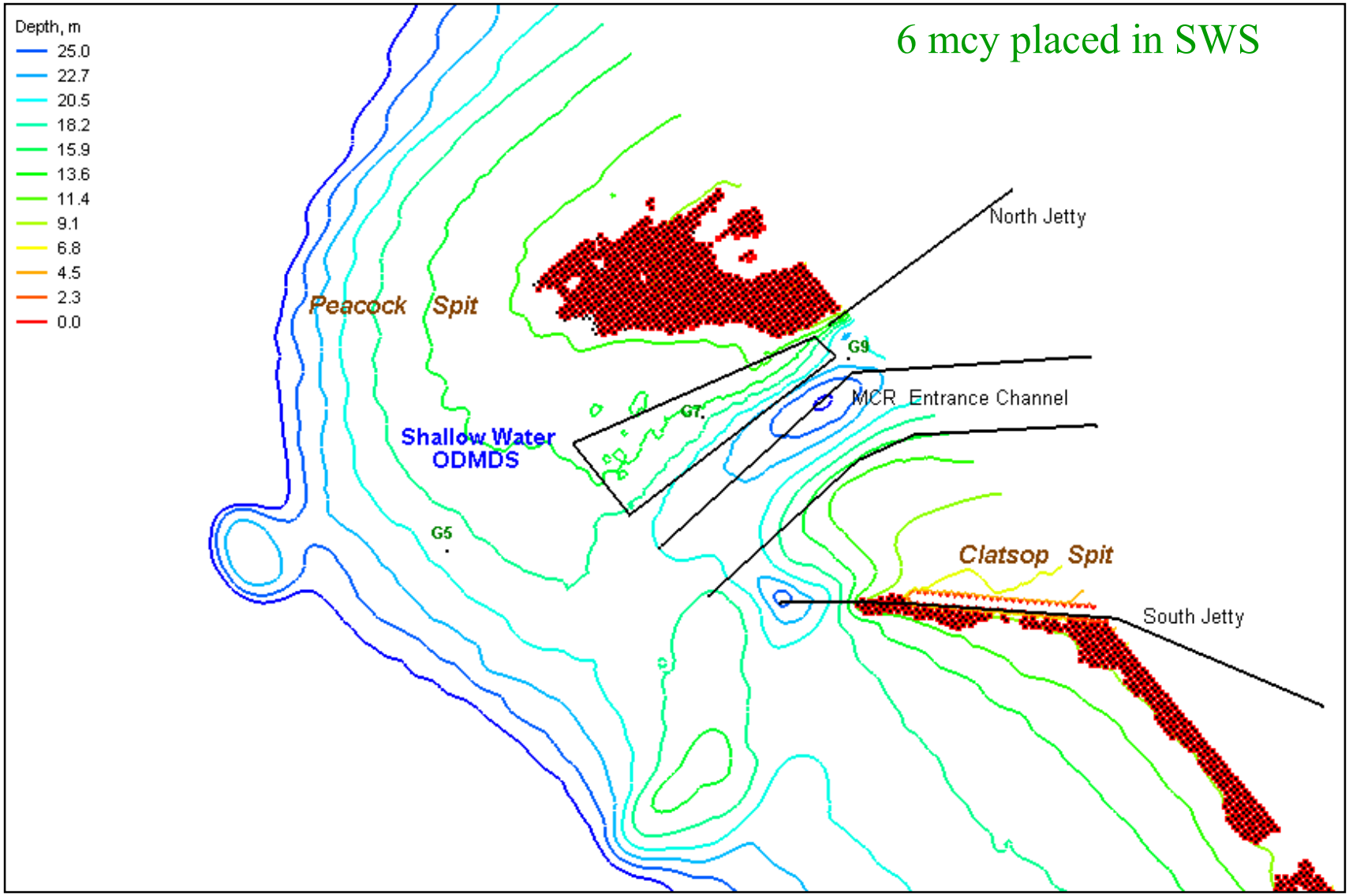
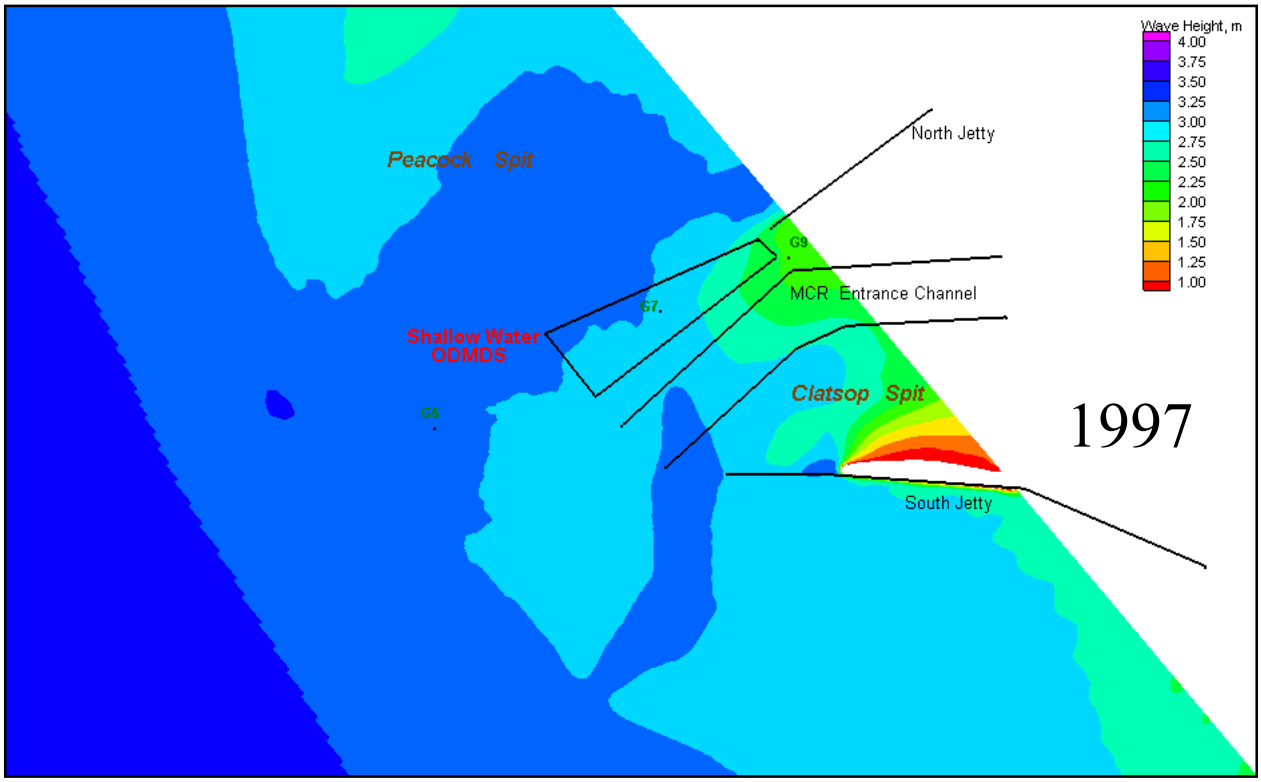


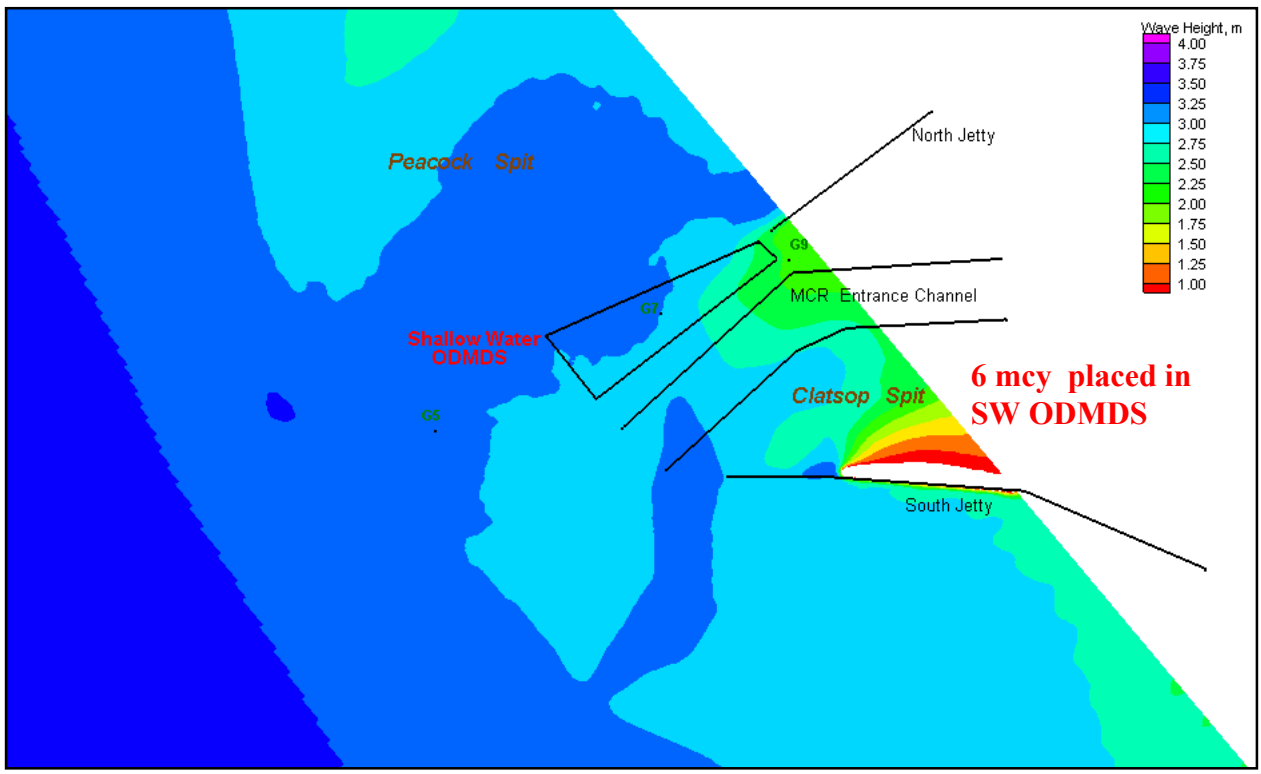
Figure M64 . Estimated wave amplification at MCR due to bathymetry change resulting from 6 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "6 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Storm: Avg. wave height = 6.76 m, Peak wave period =10.5 sec, Avg. wave direction=SW (210 deg), Wind=13.8 m/s @ S (180 deg)

Figure M65. Estimated wave breaking location for 1997 (shown in black markers) and for 6 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+6 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.





Offshore wave conditions (figure S4) for <u>Summer Storm</u>: Ht = 3.56 m, Tp=7.7 sec, Dir =200 deg, Wind=10.6 m/s @ 178 deg

Figure M66. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 6 MCY placed within SWS.

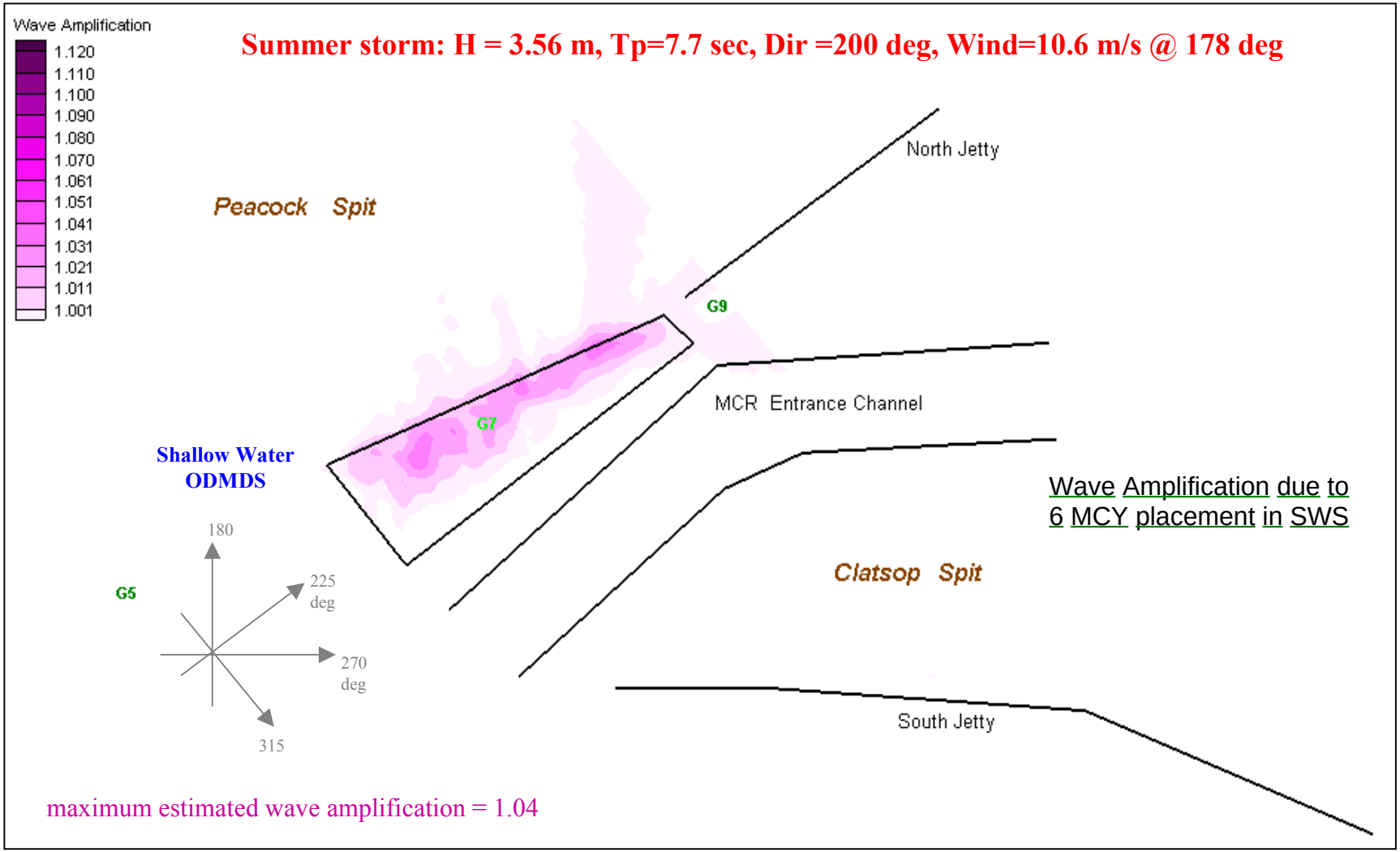
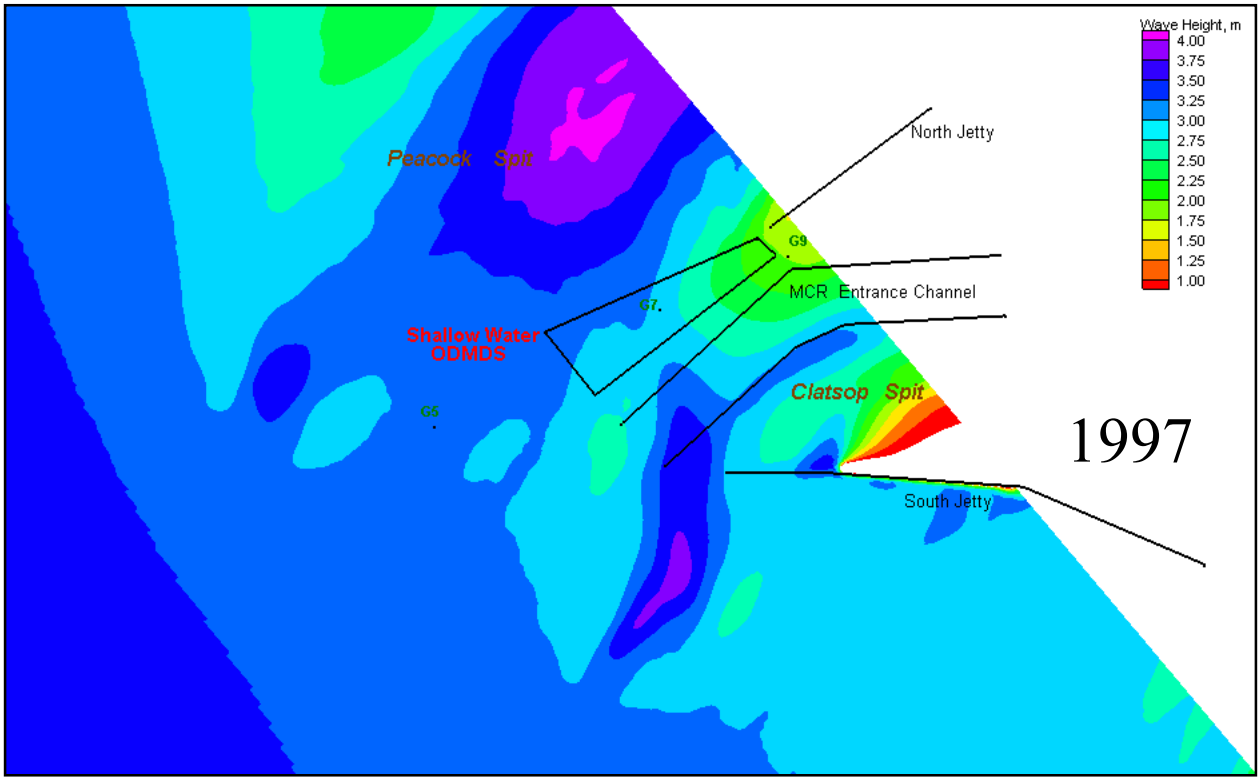
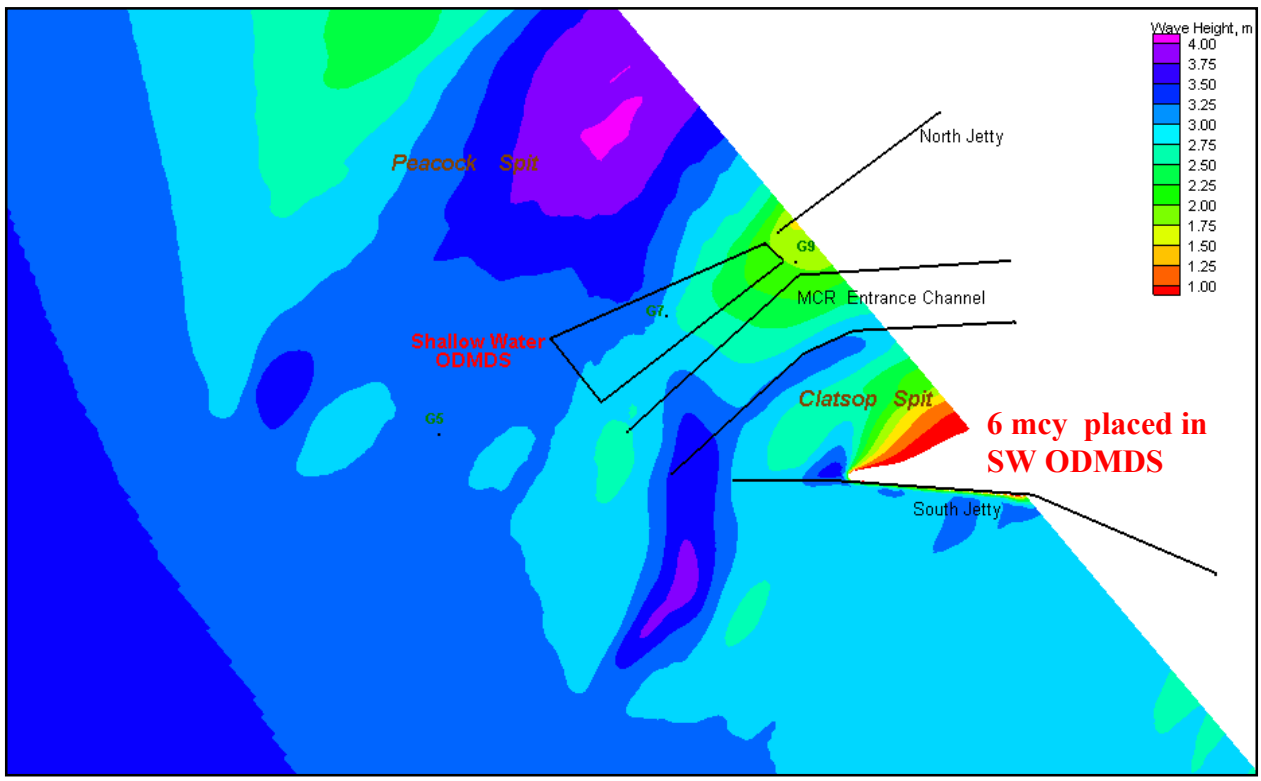


Figure M67 . Estimated wave amplification at MCR due to bathymetry change resulting from 6 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "6 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.





Offshore wave conditions (figure S5) for <u>Summer Storm</u>: Ht = 3.51 m, Tp=10.5 sec, Dir =175 deg, Wind=8.8 m/s @ 165 deg

Figure M68. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 6 MCY placed within SWS.

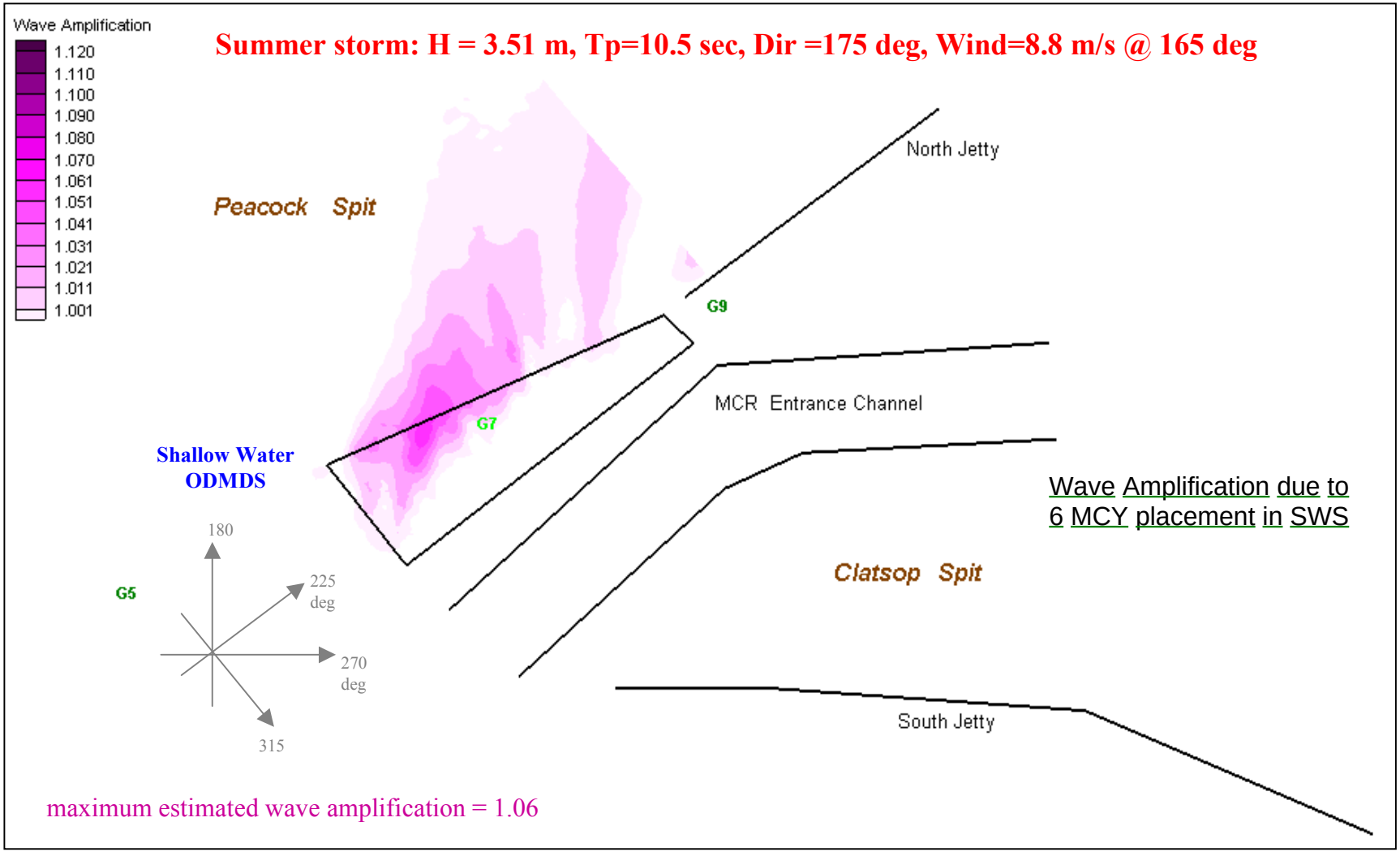


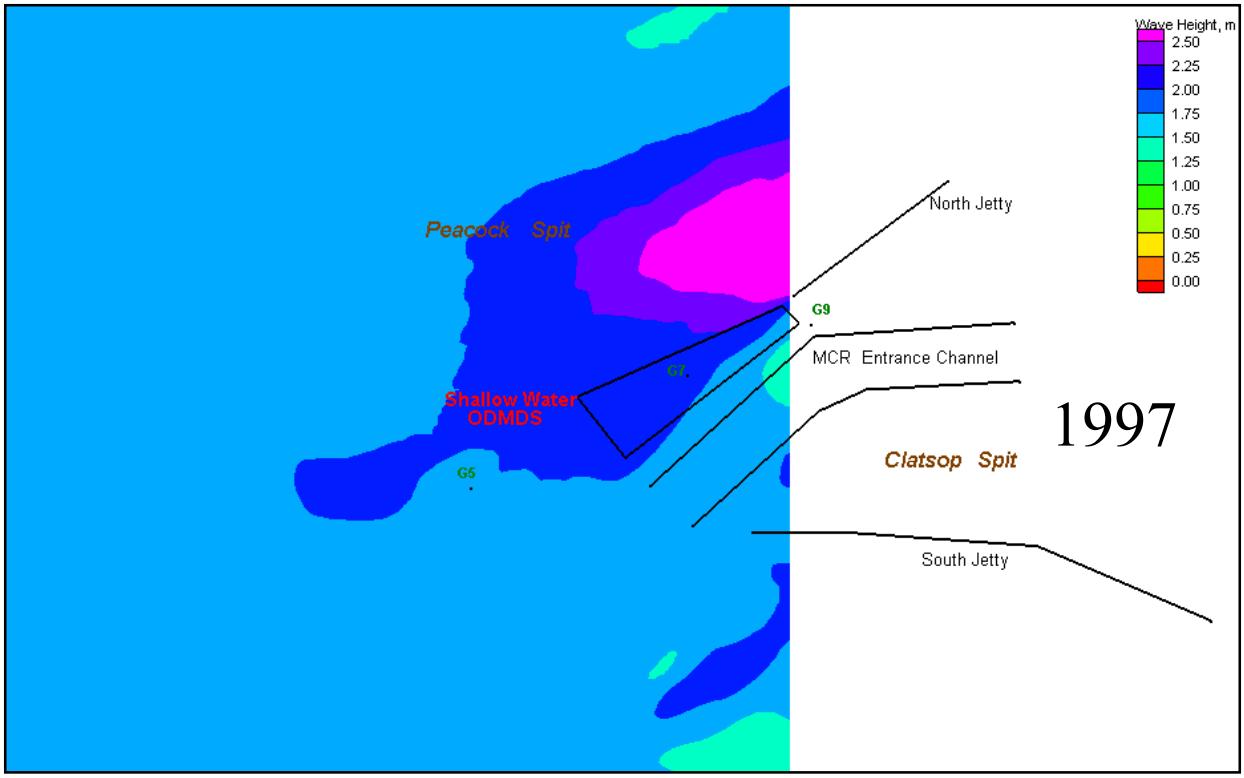
Figure M69 . Estimated wave amplification at MCR due to bathymetry change resulting from 6 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "6 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.

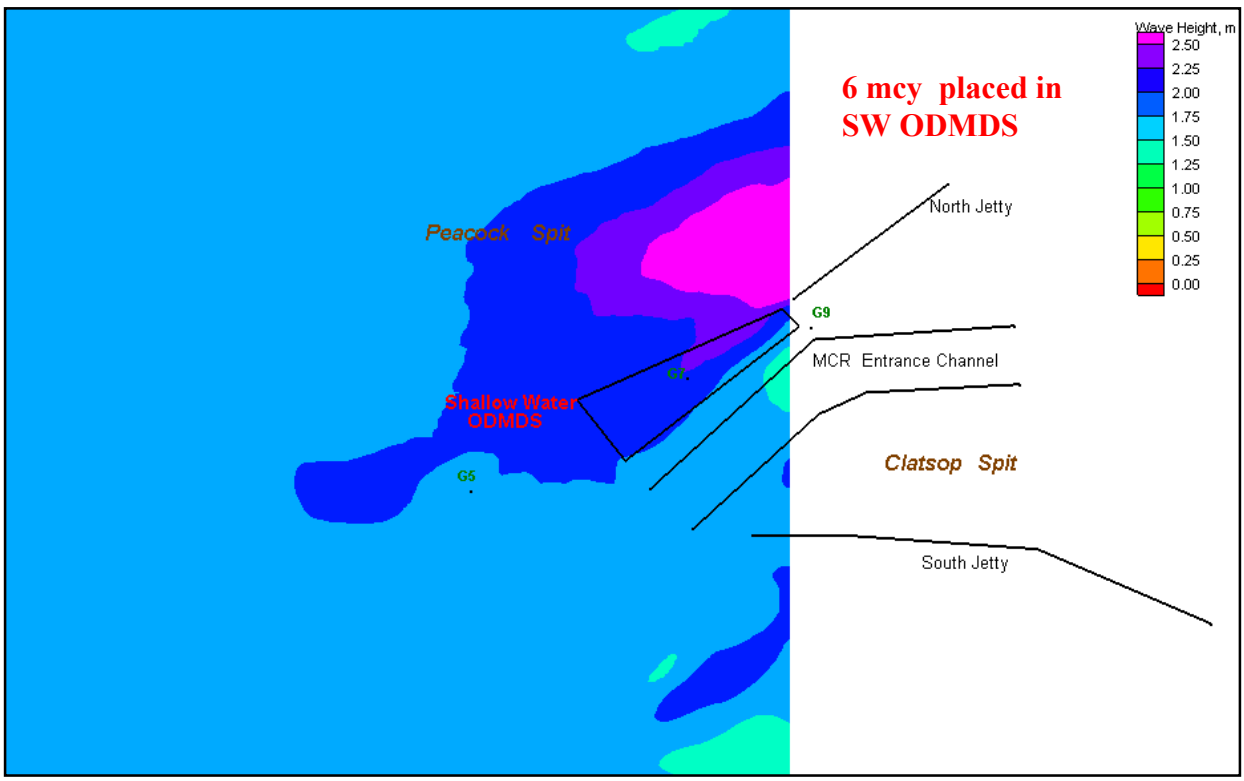
North-Northwest Wave Scenarios for Assessing **6 million cy placement** within Shallow Water ODMDS – Compared to 1997 Baseline Condition

Change in Wave Height

Changes in Wave Amplification

Changes in Wave Breaking





Offshore wave conditions (figure S6) for Summer Swell: Ht = 1.79 m, Tp=11.0 sec, Dir =275 deg, Wind=5.9 m/s @ 329 deg

Figure M70 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 6 MCY placed within SWS.

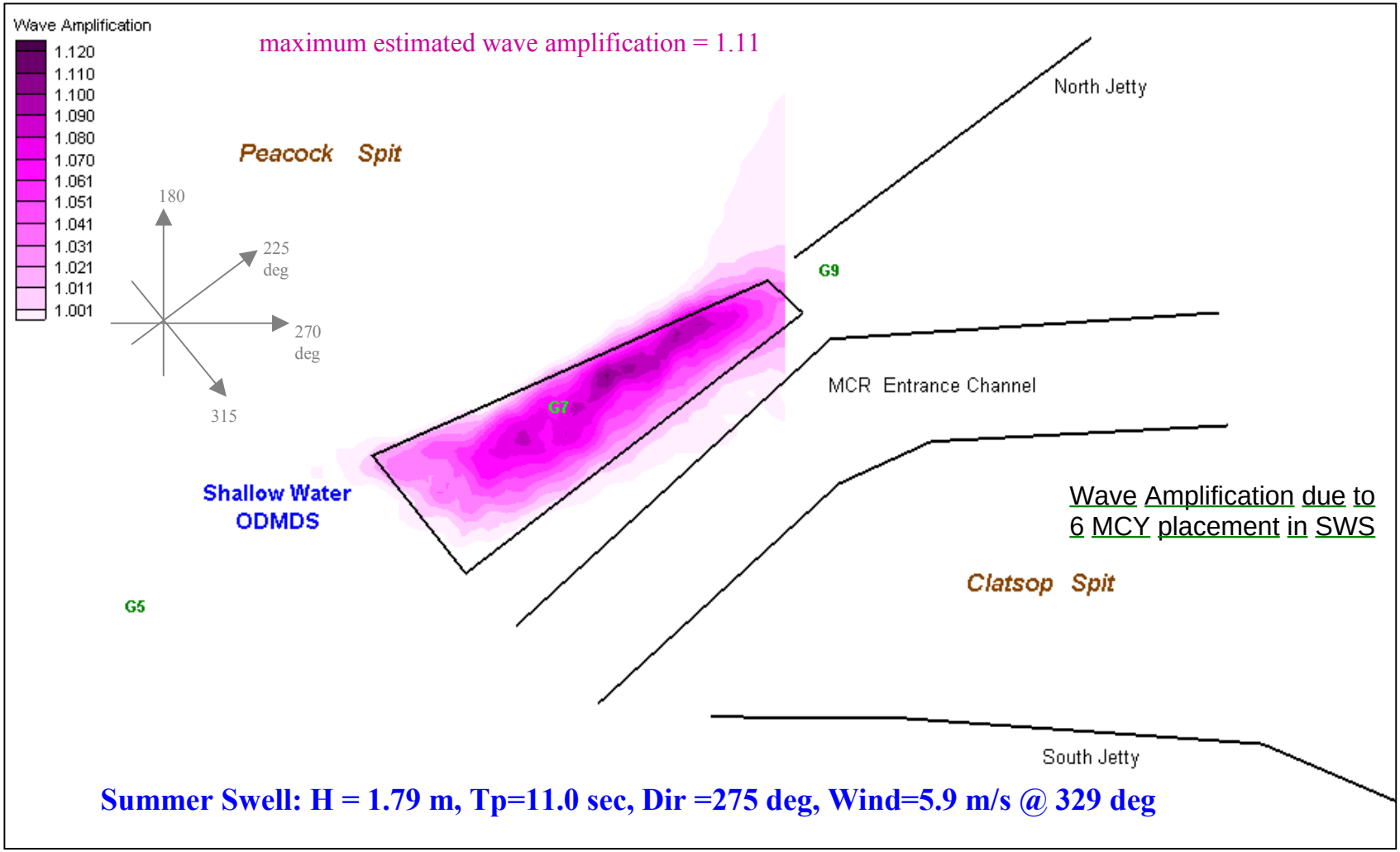
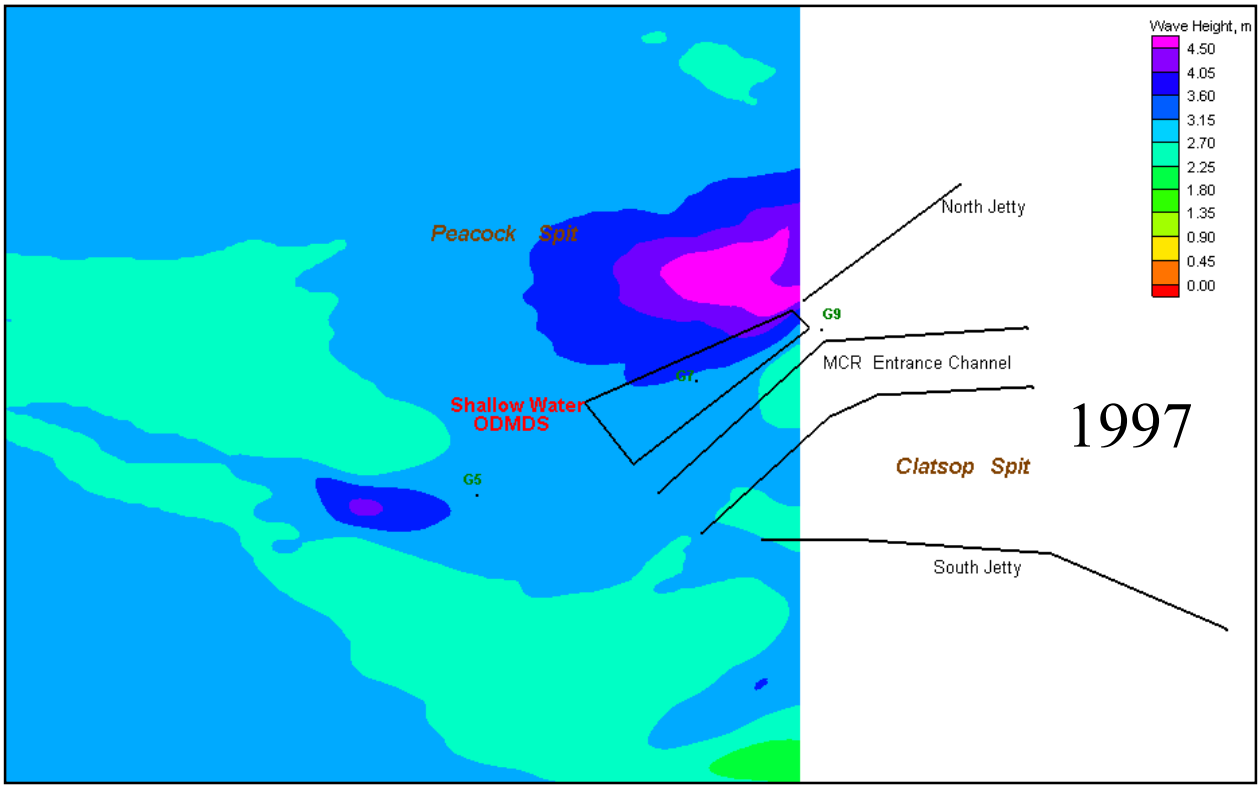
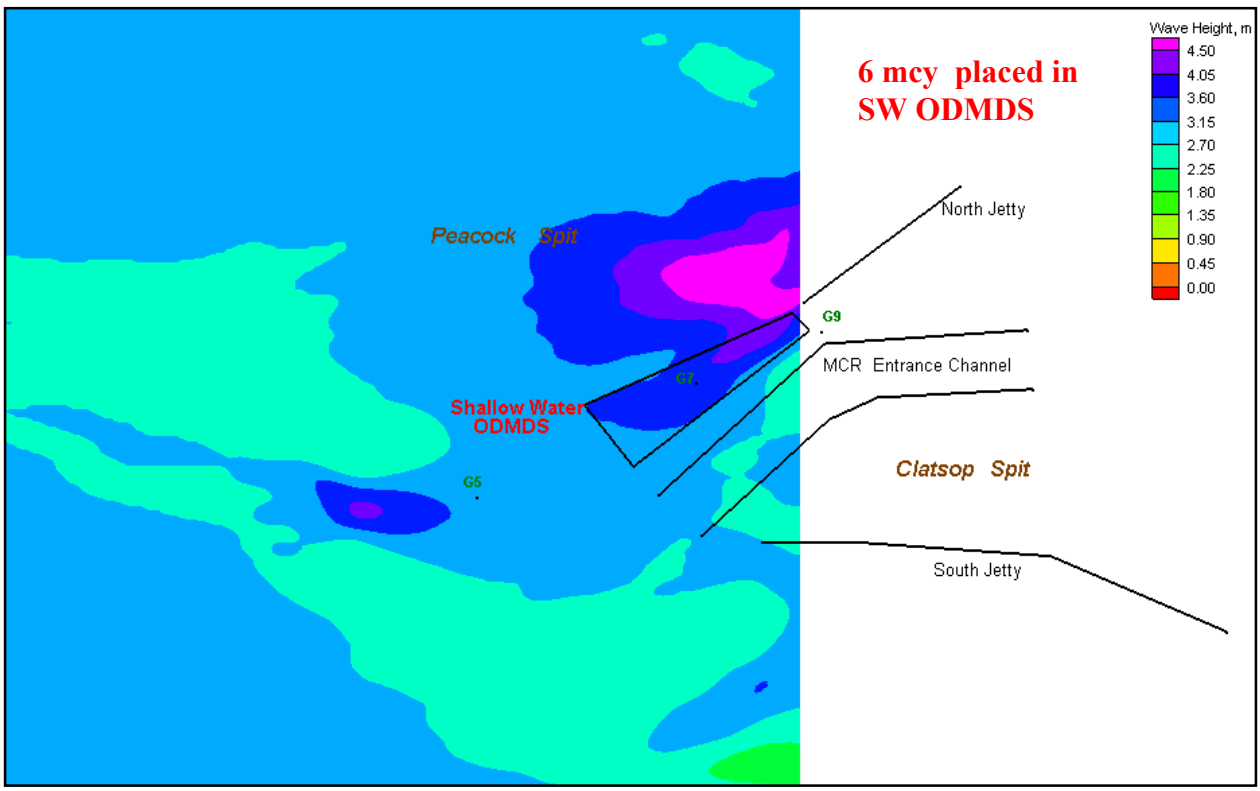


Figure M71 . Estimated wave amplification at MCR due to bathymetry change resulting from 6 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "6 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.





Offshore wave conditions (figure S7) for Winter Swell: Ht = 2.85 m, Tp=16.7 sec, Dir =280 deg, Wind=4.8 m/s @ 158 deg

Figure M72. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 6 MCY placed within SWS.

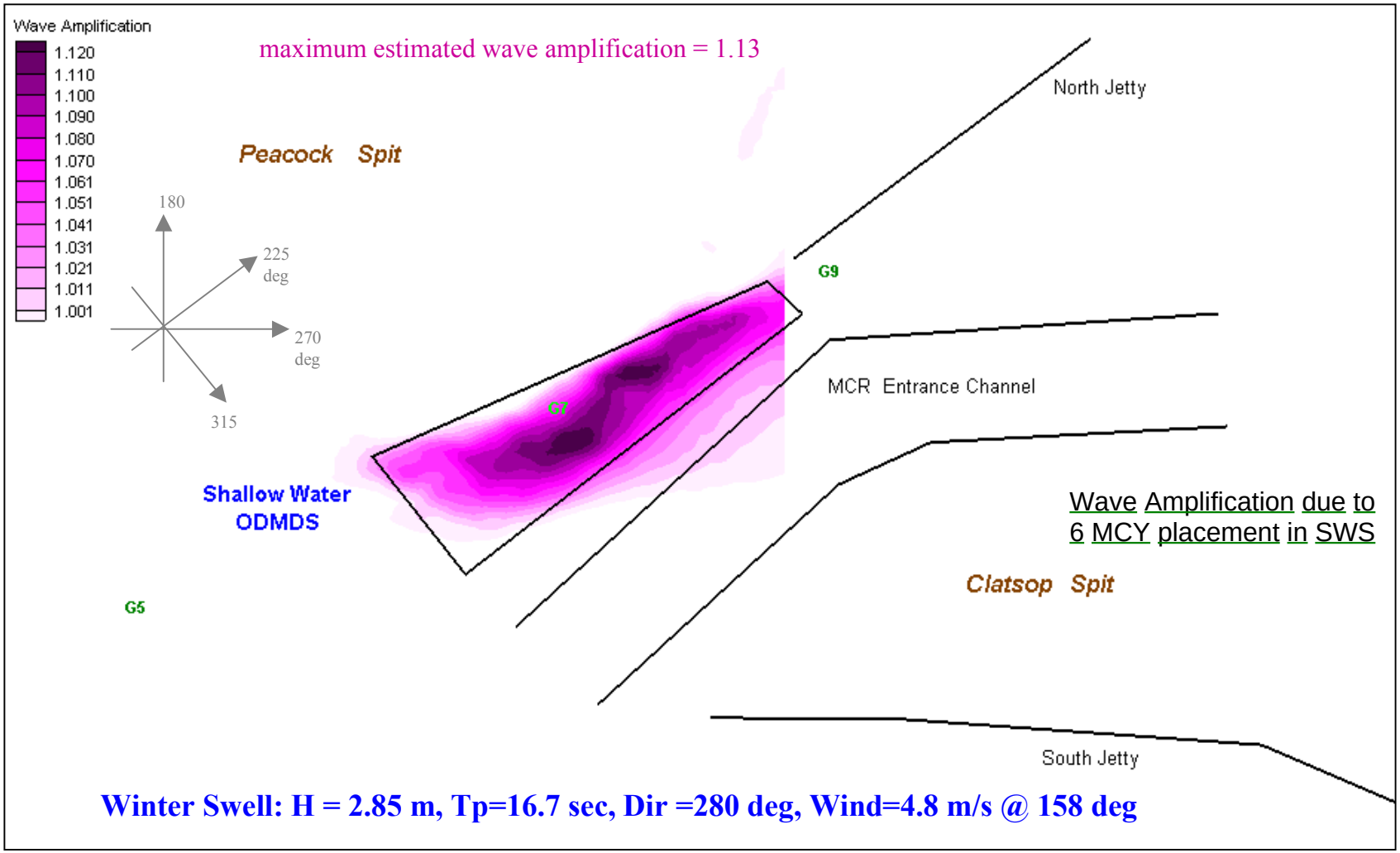
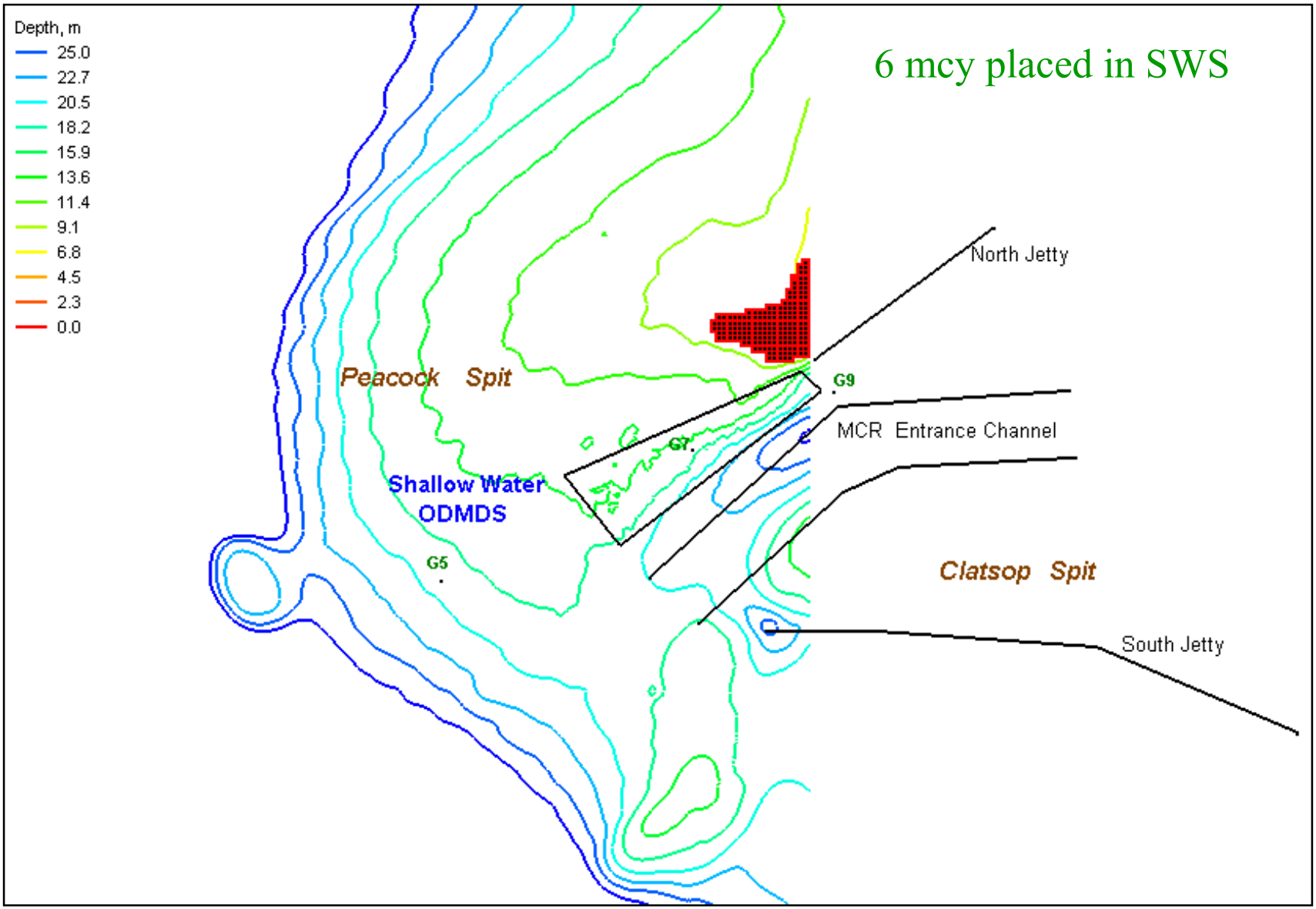
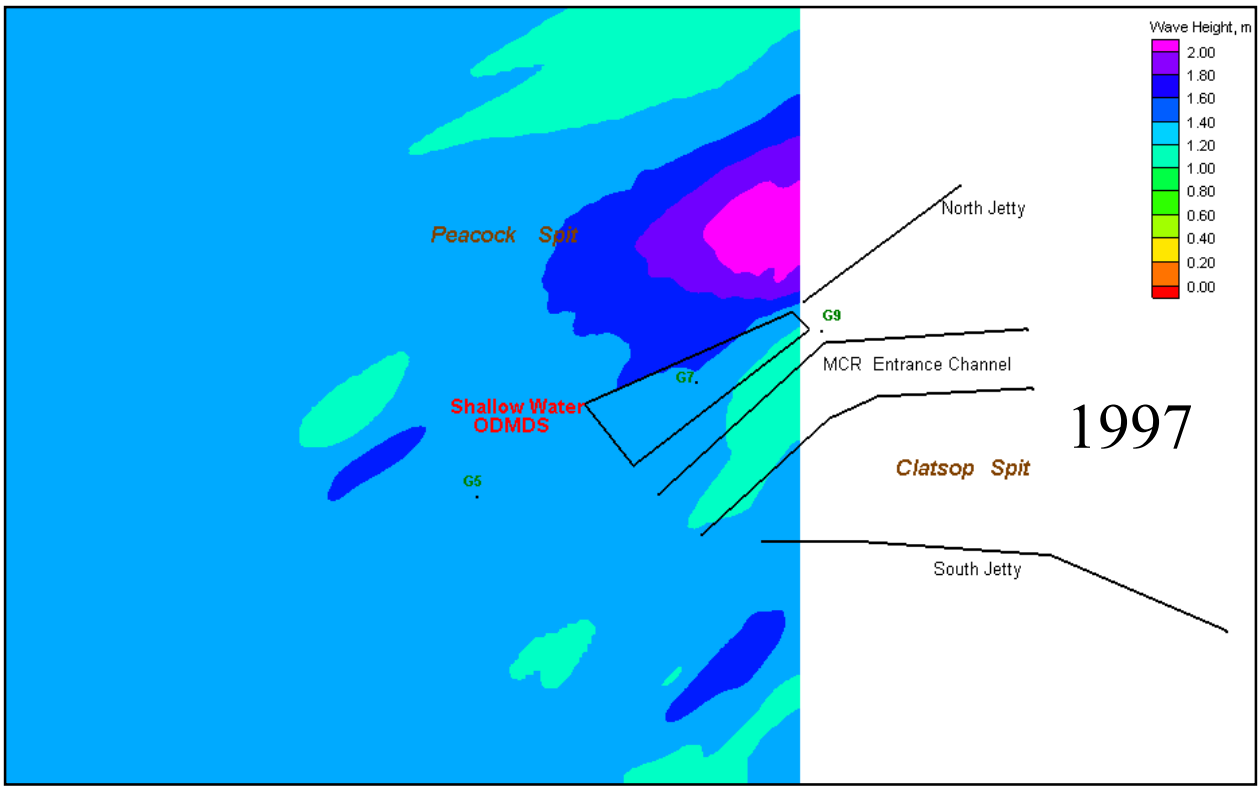


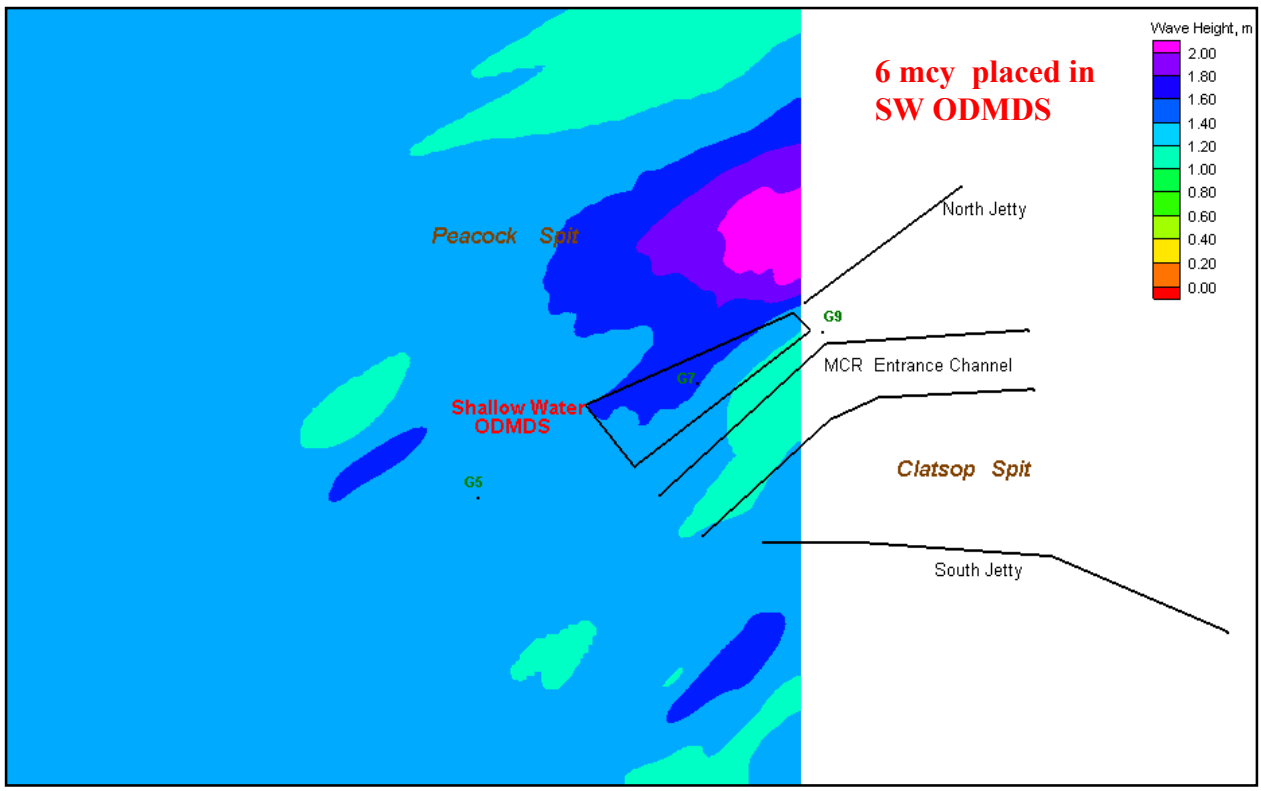
Figure M73 . Estimated wave amplification at MCR due to bathymetry change resulting from 6 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "6 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Swell: Avg. wave height = 2.85 m, peak wave period=16.7 sec, Avg. wave direction = W (280 deg), Wind=4.8 m/s @ SE (158 deg)

Figure M74. Estimated wave breaking location for 1997 (shown in black markers) and for 6 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+6 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.





Offshore wave conditions (figure S8) for Summer Swell: Ht = 1.29 m, Tp=16.7 sec, Dir =225 deg, Wind=5.4 m/s @ 316 deg

Figure M75 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 6 MCY placed within SWS.

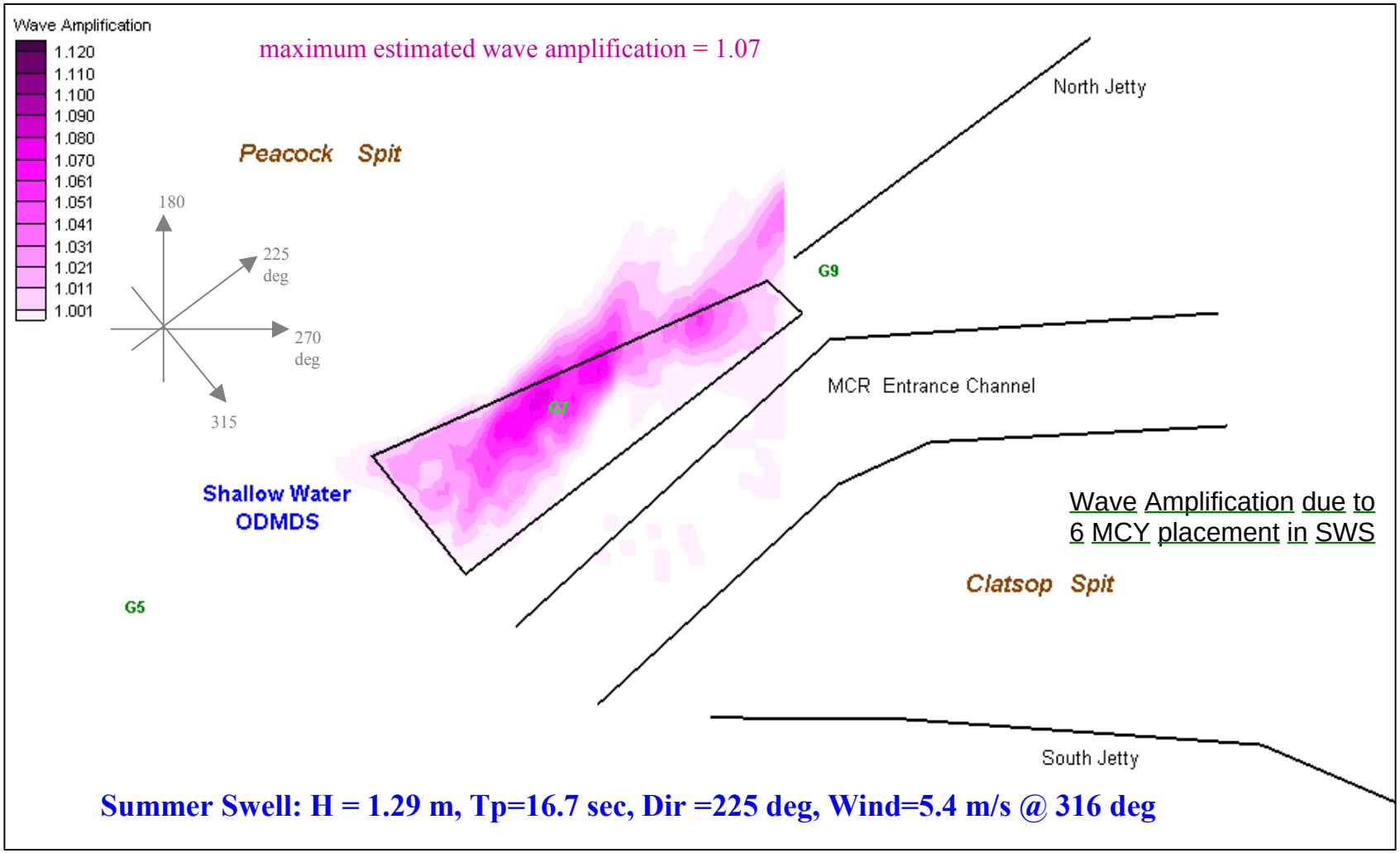
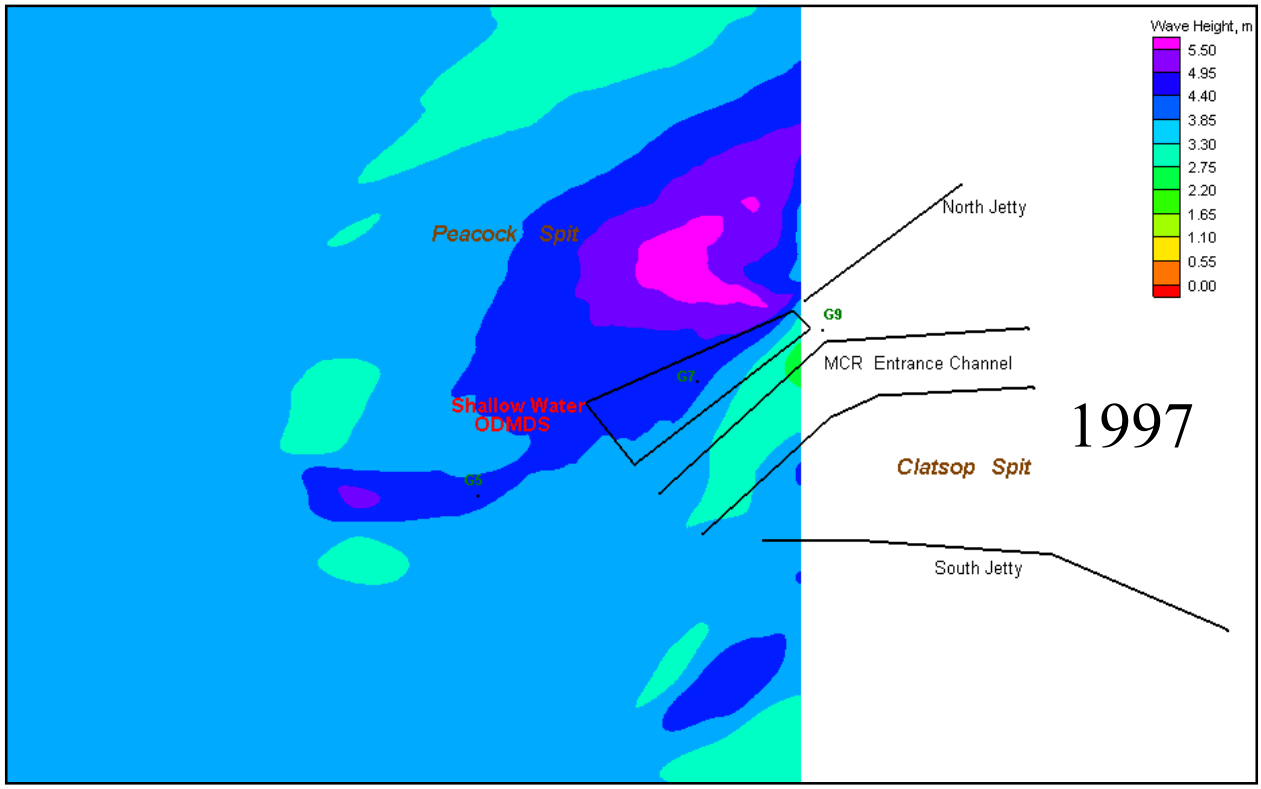
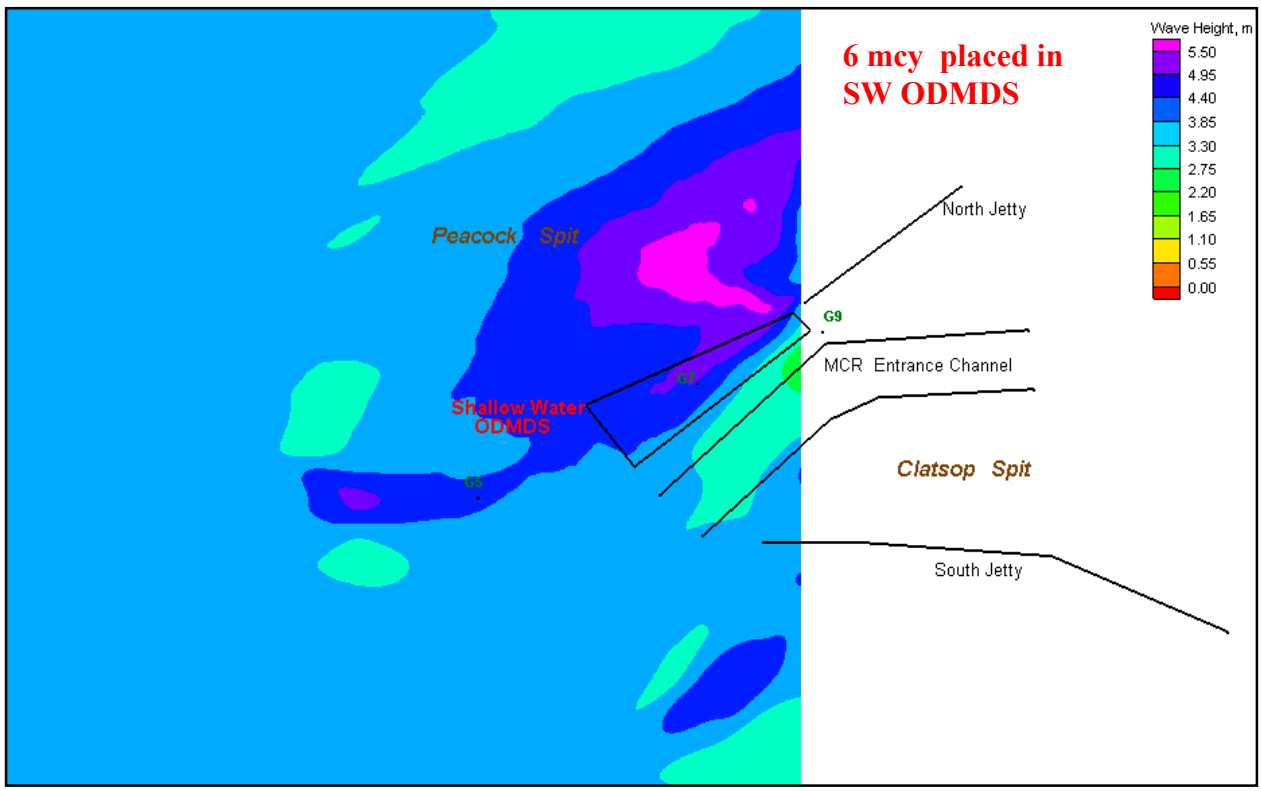


Figure M76 . Estimated wave amplification at MCR due to bathymetry change resulting from 6 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "6 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.





Offshore wave conditions (figure S9) for Winter Swell: Ht = 3.75 m, Tp=16.7 sec, Dir =275 deg, Wind=6.9 m/s @ 108 deg

Figure M77 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 6 MCY placed within SWS.

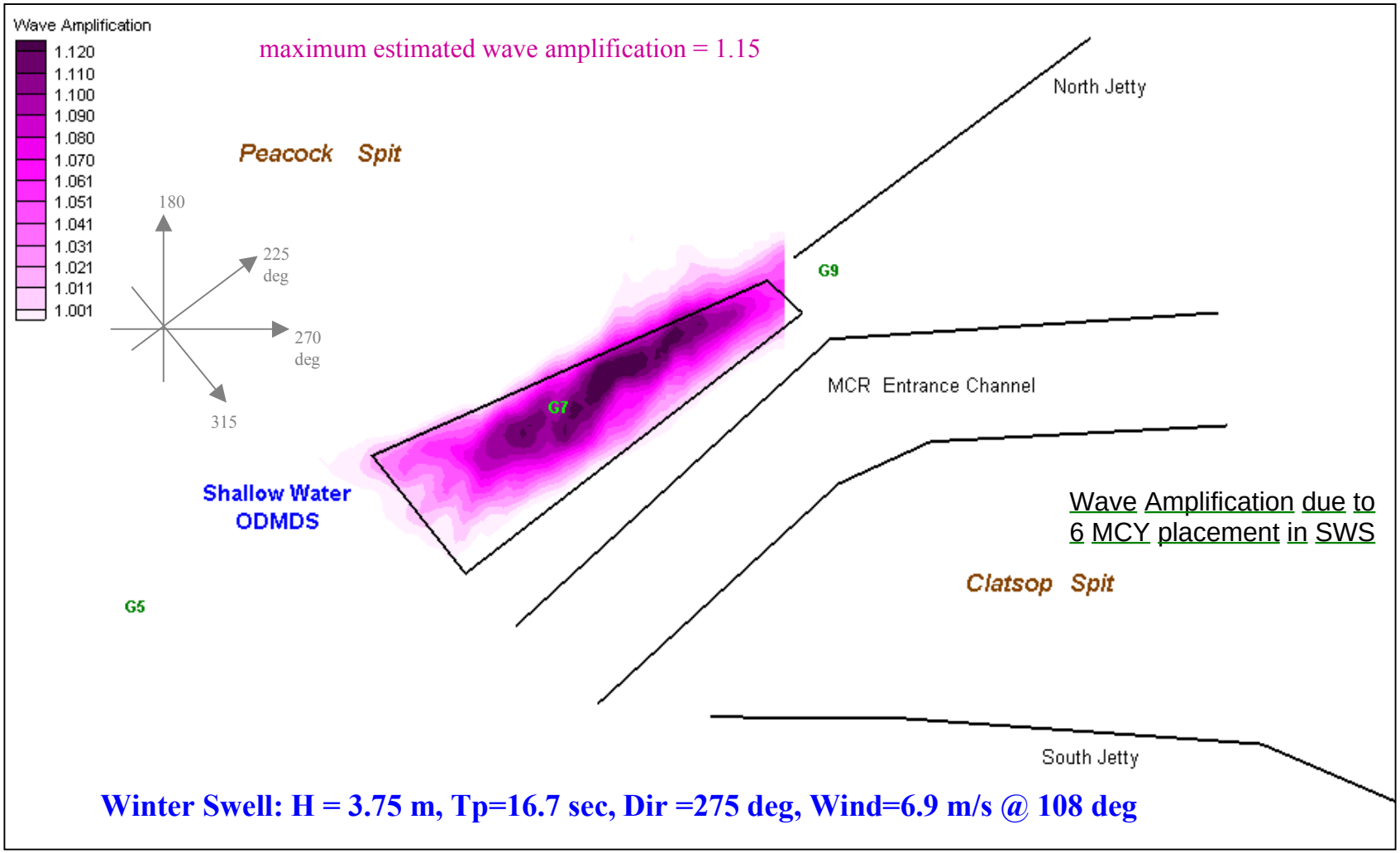
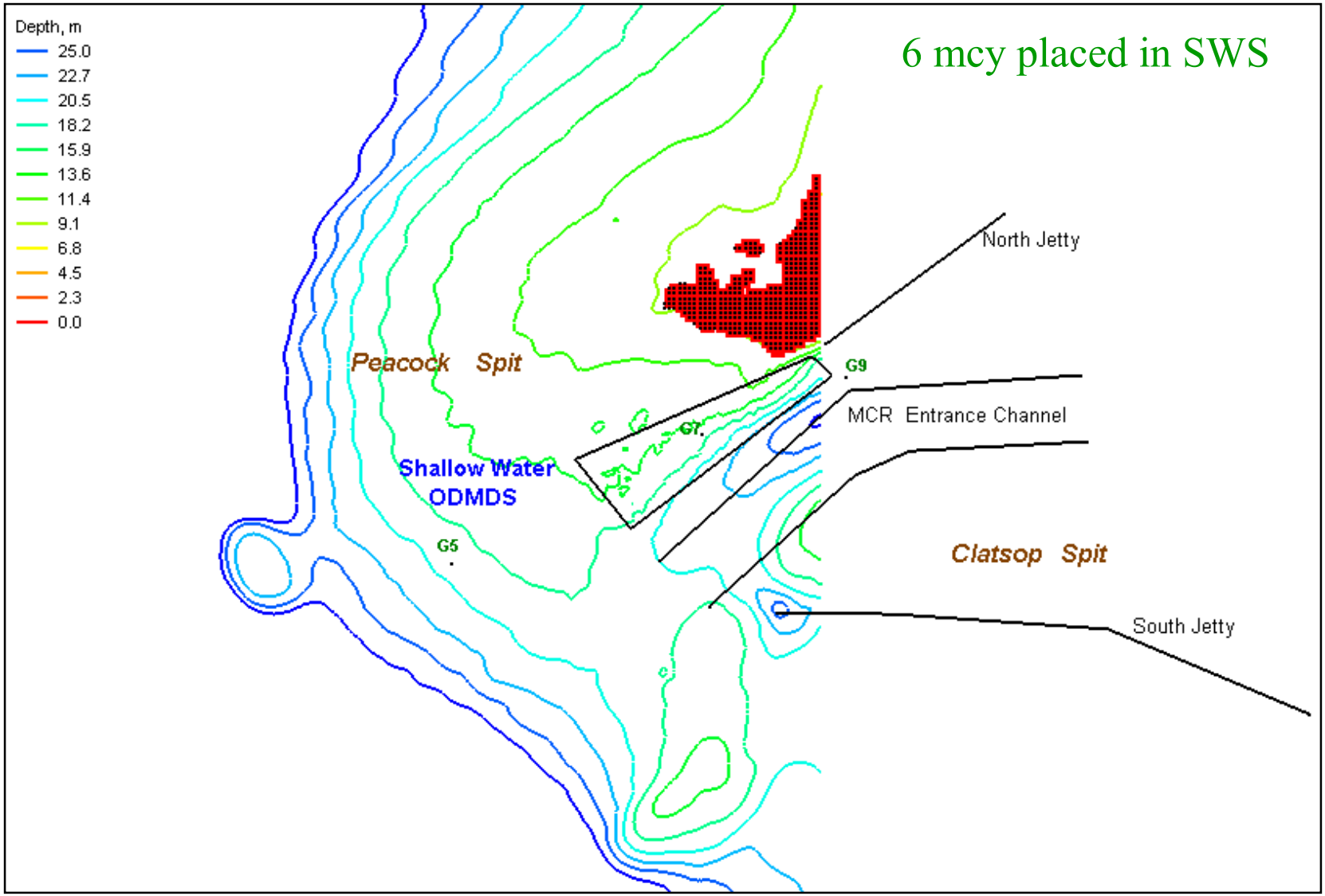
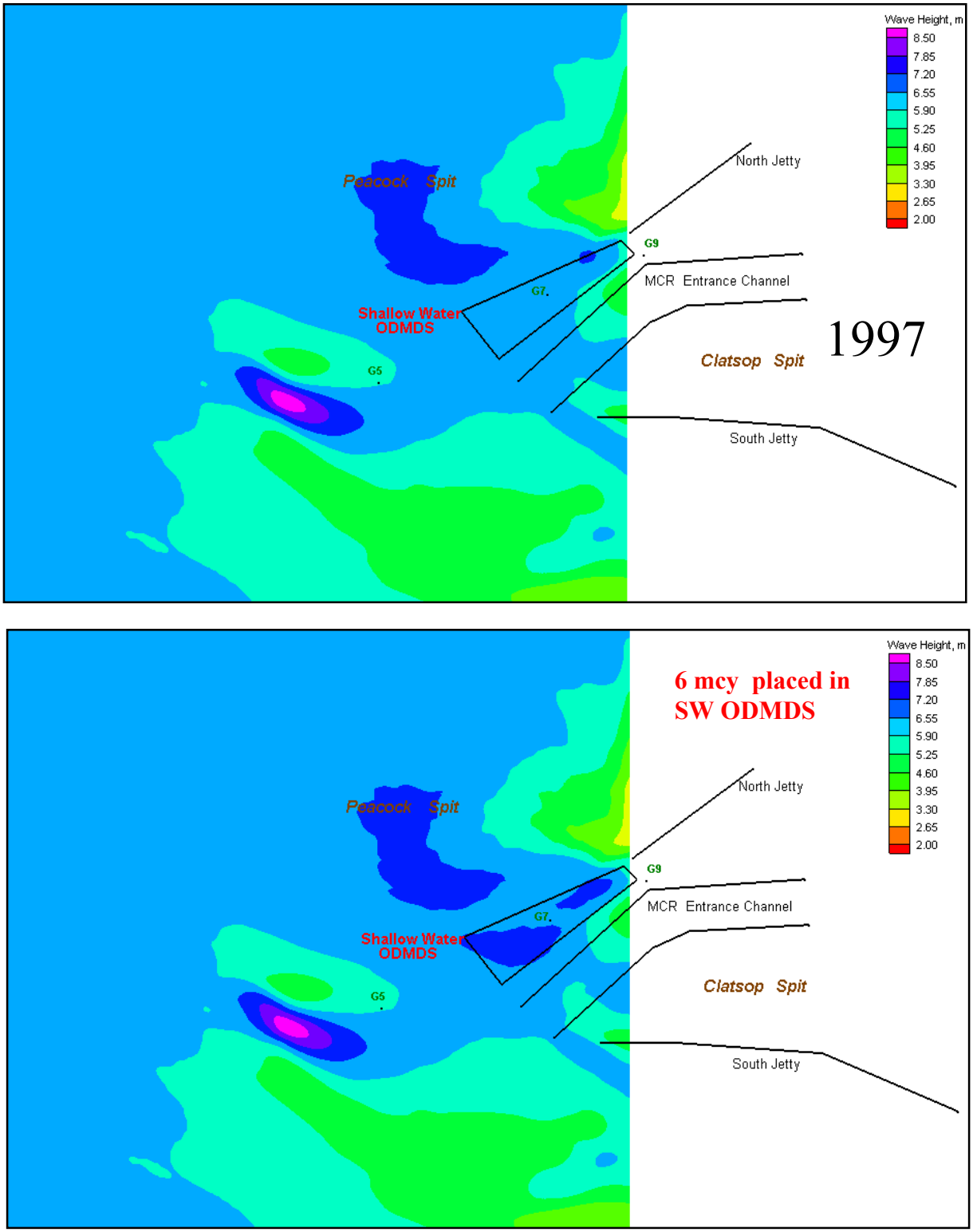


Figure M78 . Estimated wave amplification at MCR due to bathymetry change resulting from 6 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "6 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Swell: Avg. wave height= 3.75 m, peak wave period =16.7 sec, Avg. wave direction =W (275 deg), Wind=6.9 m/s @ E (108 deg)

Figure M79. Estimated wave breaking location for 1997 (shown in black markers) and for 6 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+6 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.



Offshore wave conditions (figure S10) for Winter Storm: Ht = 6.55 m, Tp=14.0 sec, Dir =310 deg, Wind=10.4 m/s @ 294 deg

Figure M80 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 6 MCY placed within SWS.

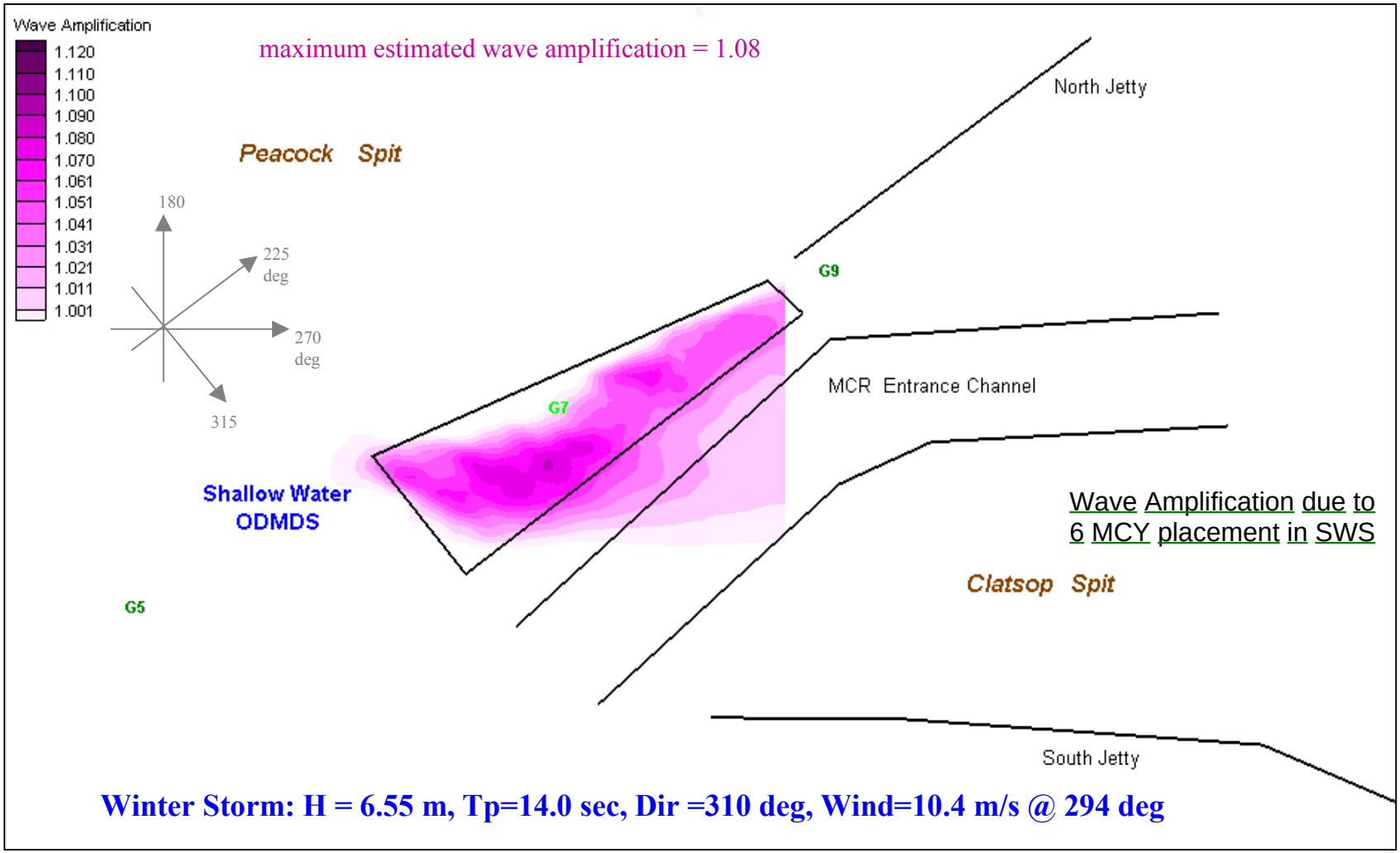
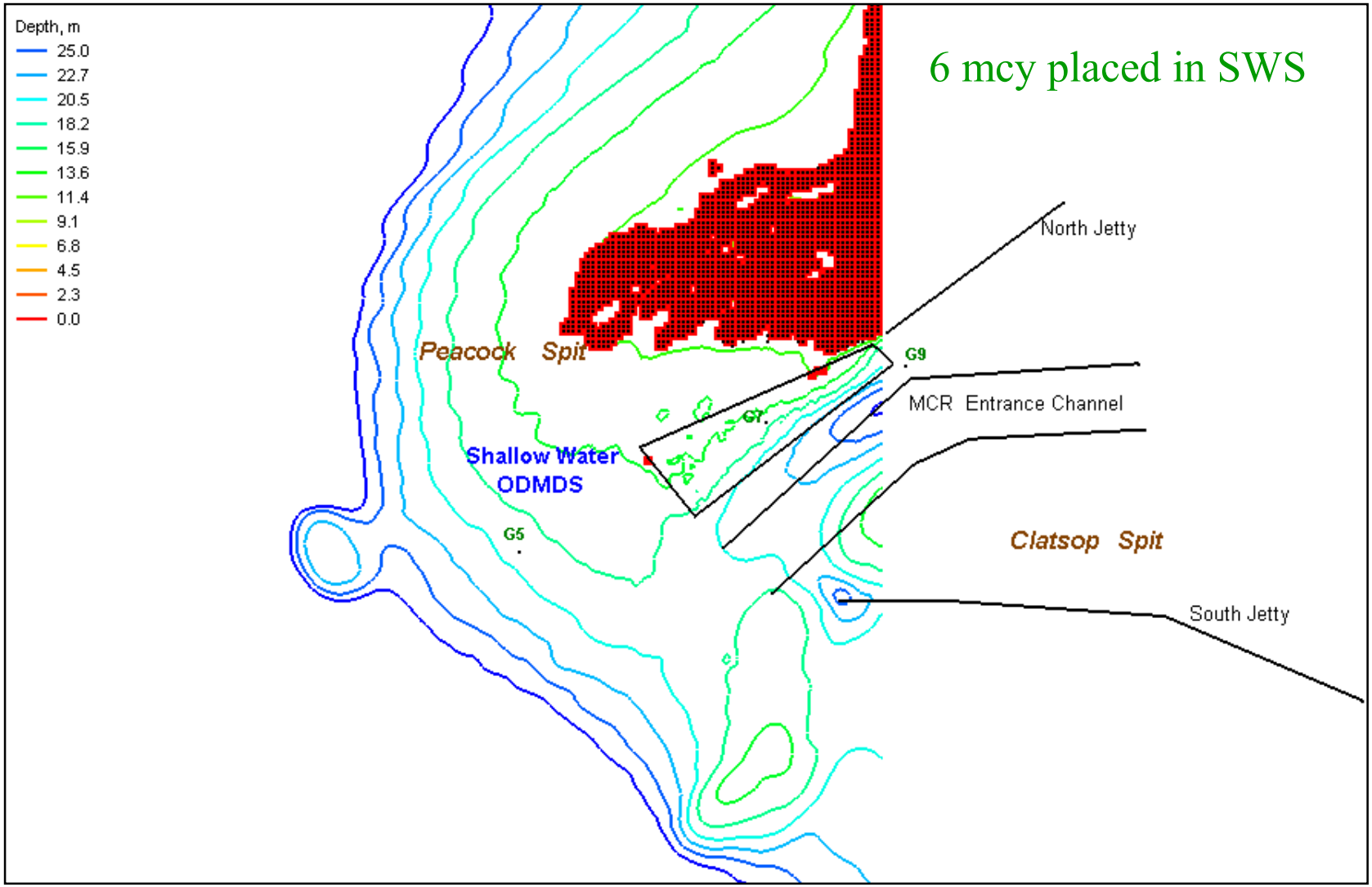
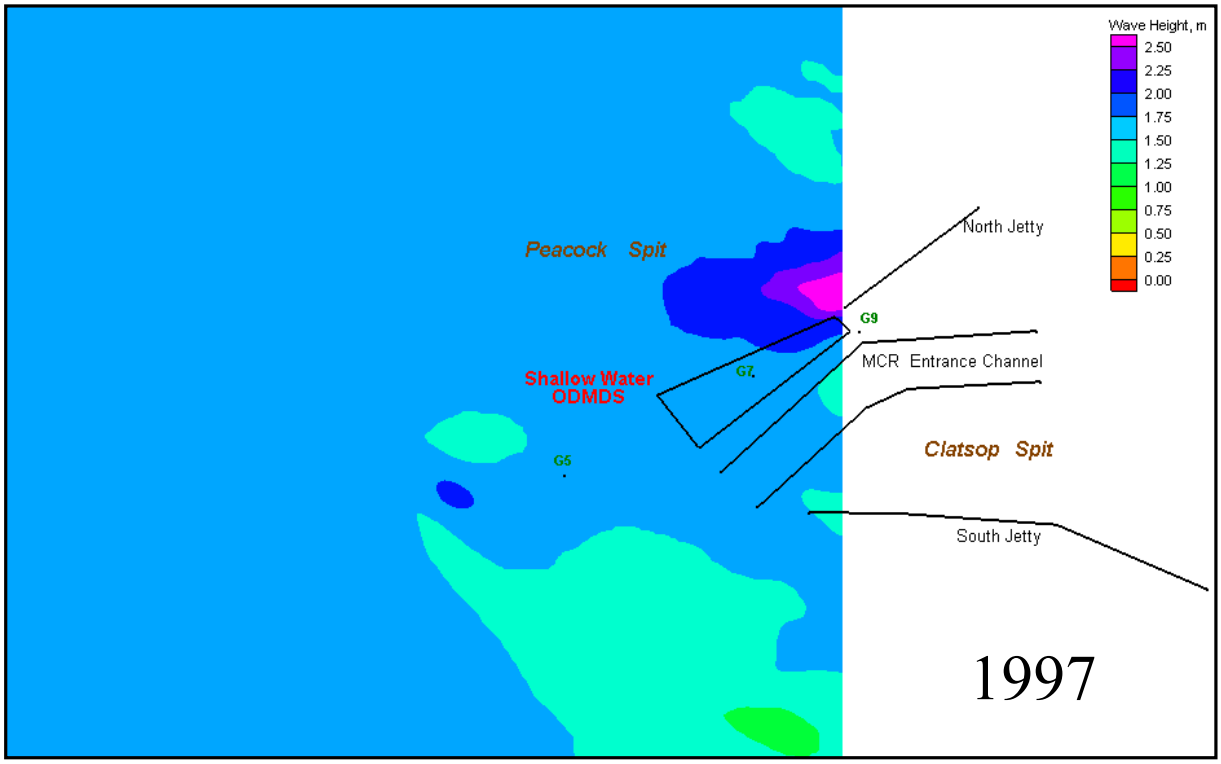


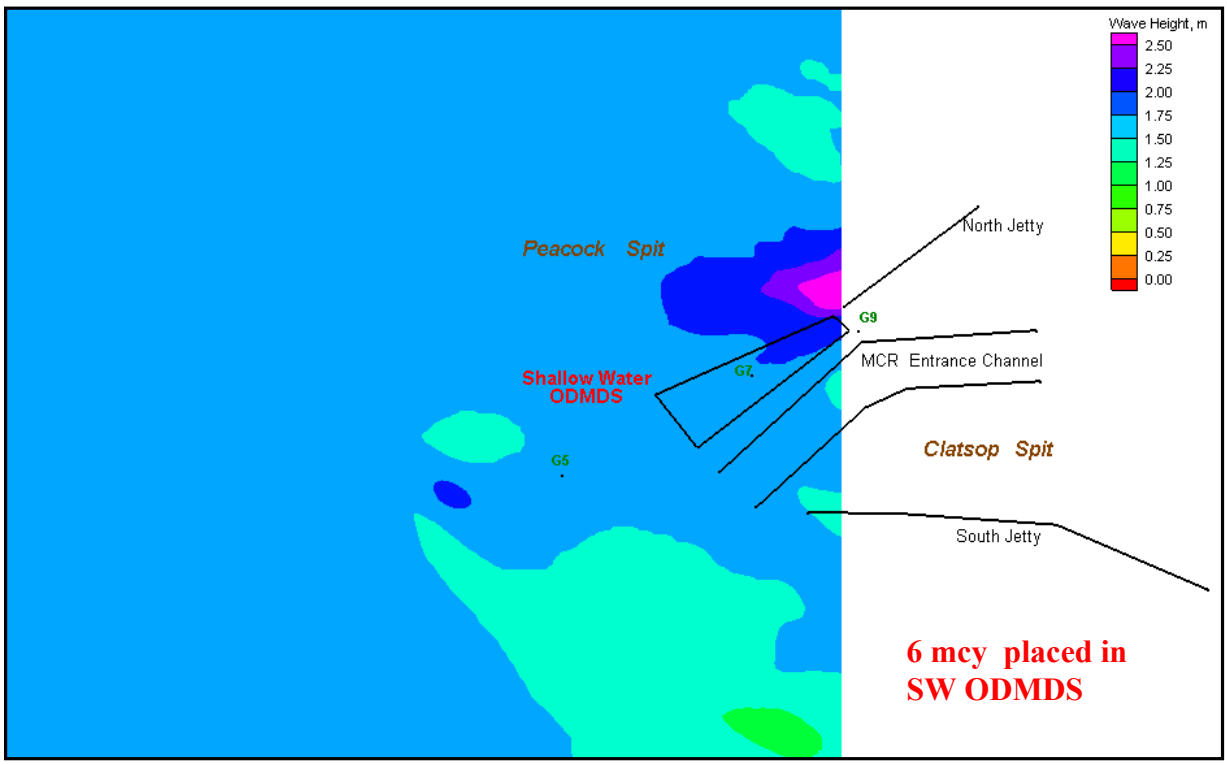
Figure M81 . Estimated wave amplification at MCR due to bathymetry change resulting from 6 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as "6 MCY wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Storm: Avg. wave height = 6.55 m, peak wave period =14.0 sec, Avg. wave direction = NW (310 deg), Wind=10.4 m/s @ NW (294 deg)

Figure M82. Estimated wave breaking location for 1997 (shown in black markers) and for 6 MCY palced in SWS (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997+6 MCY placed in SWS; depth contour values are limited to 25 meters for clarity.





Offshore wave conditions (figure S11) for Summer Swell: Ht = 1.77 m, Tp=8.3 sec, Dir =305 deg, Wind=2.1 m/s @ 334 deg

Figure M83. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 6 MCY placed within SWS.

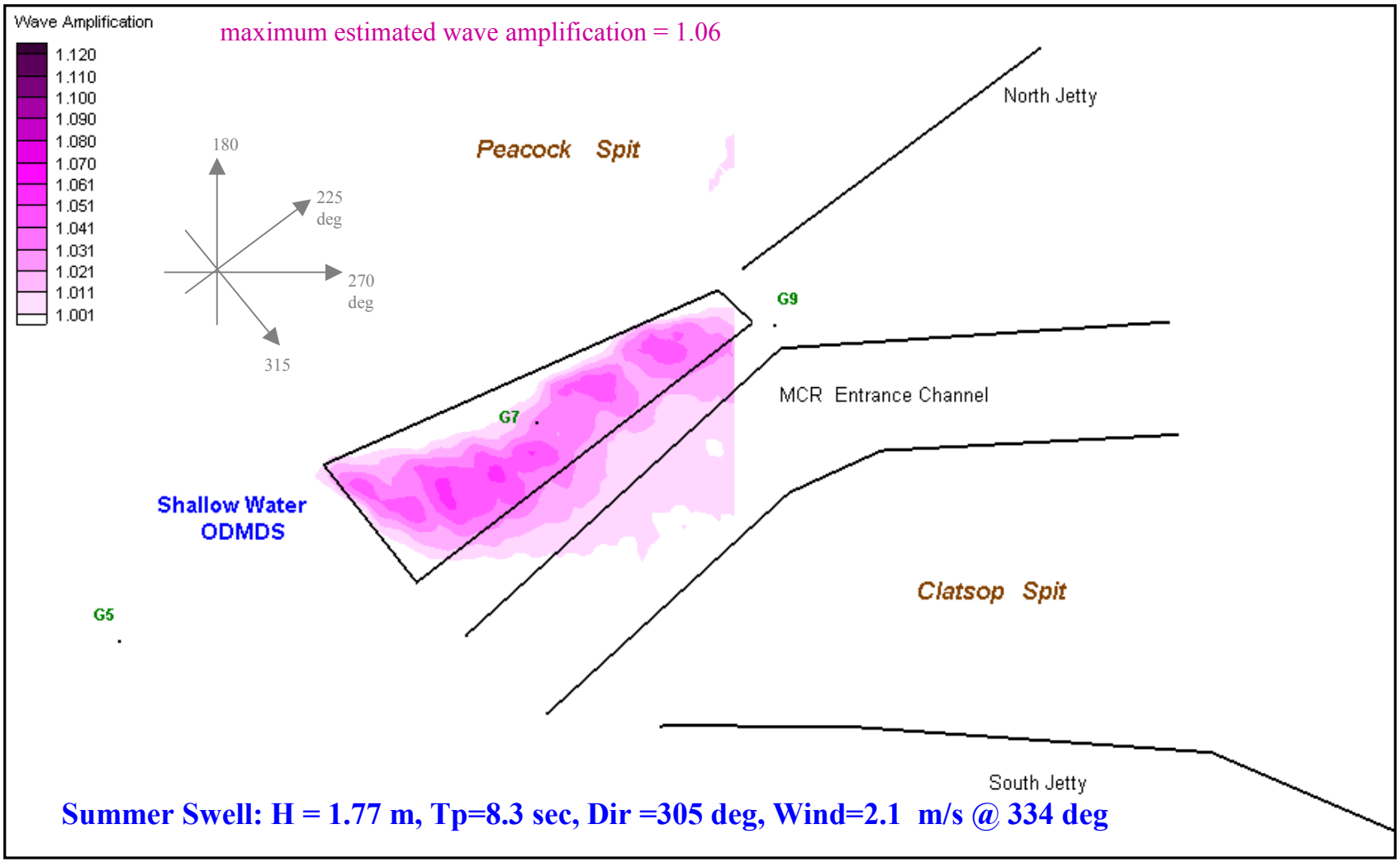


Figure M84 . Estimated wave amplification at MCR due to bathymetry change resulting from 6 MCY of dredged material being placed within SWS as compared to 1997 baseline condition, for the prescribed offshore wave condition. Wave amplification was calculated as " 6 million cy placement wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves for the 6 million cy placement scenario were estimated to be 20% greater than in 1997.